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REMARKS ON HOG CHOLERA AND SWINE PLAGUE.*

BY WILLIAM H. WELCH, M.D., PROFESSOR OF PATHOLOGY, JOHNS HOPKINS UNIVERSITY, AND A. W. CLEMENT, V.S. (FROM THE PATHOLOGICAL LABORATORY OF THE JOHNS HOPKINS UNIVERSITY.)

(Continued from page 348.)

IN a recent interesting and important study of swine pest in Denmark, by Bang, the author finds a bacillus which he calls the "vacuole bacillus," and identifies, doubtless correctly, with the swine-plague bacillus of this country. The bacillus was found frequently in swine pest, and is regarded as the cause of the pneumonia and pleurisy associated with swine pest. By inoculating mice and rabbits with bits of organs of pigs dead of swine pest they usually died from infection with this "vacuole bacillus." Pigs inoculated directly into the lungs died of pneumonia without intestinal lesion. Feeding swine with the cultures was harmless. The conclusion reached by this investigation is that in Denmark, as well as in America, swine pest (hog cholera) is often combined with infection with the swine-plague (vacuole) bacillus. This demonstration by Bang of the essential identity of the Danish epizootics with those of this country as regards the two micro-organisms, about which such bitter contests have been waged, is of signal importance, and a confirmation, in important particulars, of the work of the Bureau of Animal Industry and of our own work on this subject.

* Read at the First International Veterinary Congress of America, held in Chicago, Ill., in October, 1893.

As already mentioned, both the swine-plague bacillus and the hog-cholera bacillus appear to have been isolated from cases of pneumo-enteritis of swine (hog cholera) in France, but the French investigators have not come apparently to any clear understanding of the relation of these organisms to the natural disease, and often the descriptions of the bacteria concerned are so conflicting or so imperfect that it is difficult or impossible to identify them.

Since the first recognition and description of the swine-plague bacillus in this country, in 1886, in the third Annual Report of the Bureau of Animal Industry, the important question as to its relation to other bacteria which had been described has been whether or not our swine-plague bacillus is identical with the German Schweine-seuche bacillus. That our hog-cholera bacillus was widely different from the Schweine-seuche bacillus was clear enough even then, and this matter would have continued clear enough if the writings of F. Billings had not confused those whose knowledge of one or both of these organisms was derived only from reading about them.

It was assumed in this first publication of the Bureau of Animal Industry that the swine-plague bacillus is identical with the Schweine-seuche bacillus, which at that time had been shown by Schütz to be the cause of infectious pneumonia in pigs in Germany. The name swine plague (which in the previous report of the Bureau of Animal Industry had been given to hog cholera) was transferred to the disease caused by the new bacillus, on the supposition that it was the cause of epizootic disease in this country, identical with the German Schweine-seuche. Some confusion would have been avoided if another name had been selected for the new bacillus.

We were the first to institute a comparison between cultures of the swine-plague bacillus and the Schweine-seuche bacillus. The latter was obtained from the Hygienic Institute in Berlin in the early part of 1889, and as stated in an article published by one of us (Welch) in 1889, the Schweine-seuche bacillus appeared to be identical with the swine-plague bacillus. This statement was based upon the comparison of the cultures and the inoculation of rabbits and mice. We obtained a second culture of the Schweine-seuche bacillus from the Hygienic Institute, through the kindness of Drs. Von Esmarch and R. Pfeiffer, in 1890. This culture was extremely virulent, far more so than the first. It could not be distinguished as regards the morphology of the bacteria, their behaviour in culture media, and their pathogenic effects on

mice, rabbits and guinea-pigs from cultures of our most virulent swine-plague bacillus, but it differed from the swine-plague cultures in being uniformly fatal to pigs by subcutaneous inoculation in moderate doses. In this respect, as in all others, it was like a culture of the Wild-seuche bacillus which we obtained from Berlin. We have never, out of the large number of swine-plague cultures obtained from various epizootics in this country, found one which was usually fatal to pigs by subcutaneous inoculation, although now and then a pig would die from general infection by this method with lesions identical with those after inoculation with the virulent Schweine-seuche germ, namely, spreading local œdema and general septicæmia. The local œdema, however, was not so extensive as in the Schweine-seuche cases. Still a third culture obtained from Kral, in Prague, was again less virulent and indistinguishable from swine plague. Whether, as claimed by F. Billings, under the name Schweine-seuche have been embraced different affections, of which one is identical with Wild-seuche, or, as we think to be more probable, we are to recognise only one Schweine-seuche bacterium with varying degrees of virulence, is not certain. The Wild-seuche bacterium is now considered by some to be identical with that of Schweine-seuche. The Schweine-seuche cultures, both those fresh from the pig and old ones, in the hands of German investigators have also varied decidedly in virulence, as do also those of our swine-plague, although no swine-plague culture, even fresh from the pig, has been obtained in equalling in virulence, as tested on pigs, the most virulent Schweine-seuche cultures. We observed that pigs which survived repeated inoculation with swine-plague cultures had not lost in any degree their susceptibility to Schweine-seuche. We have had most virulent swine-plague cultures which retained their primary virulence indefinitely in successive cultures.

The only other investigators who have compared, so far as we are aware, cultures of Schweine-seuche and of American swine-plague have been Theobald Smith* and Afanassieff.† Smith used the two Berlin cultures of Schweine-seuche which we gave him. With the first culture he did not succeed in killing rabbits, whereas we produced with it, although not uniformly, the same effects in rabbits as with the swine-plague germ of weakened virulence, that is, after subcutaneous inoculation, local exudate at site of inoculation and peritonitis, the rabbits dying in intervals varying

* Smith, op. cit. †Afanassieff, loc. cit.

from four to fifteen days. The morphological and biological properties of the two bacteria he found identical. His results with the second culture were identical with our own.

Afanassieff, who worked in Baumgarten's laboratory, obtained his culture of the swine-plague bacillus from F. Billings. It was of weak virulence as compared with many cultures of swine plague which in small doses kill rabbits regularly in less than twenty-four hours. He comes to the conclusion that this culture is identical with that of Schweine-seuche of weak virulence. He made no comparison by inoculation of pigs, which in our experience it is important should be done.

Our own conclusion as to the bacteria of Schweine-seuche and of swine plague is that no difference exists between them as regards morphology, cultural behaviour, and pathogenic effects on rabbits, mice, and other laboratory animals. Cultures of each occur which are also indistinguishable by inoculation of pigs. The only difference by laboratory experiment which has thus far been brought out is that there occur Schweine-seuche bacteria of higher degree of virulence as tested on pigs than any swine-plague bacteria which have hitherto been isolated from pigs in this country. Another point to be considered in this connection is that Schweine-seuche occurs as an independent disease in Germany without association with hog cholera, whereas swine plague has not been shown to prevail with the same independence as an epizootic in this country. Nor have any cases of cutaneous swine plague analogous to the so-called cutaneous Schweine-seuche been observed in this country as a natural disease.

These points of difference do not suffice to distinguish the bacillus of Schweine-seuche from that of swine plague; at the same time they indicate that we are not at present warranted in asserting unqualifiedly the absolute identity of these bacteria. The whole question as to identity and to separation into varieties and species of various members of the group of bacteria which includes those of swine plague, Schweine-seuche, Wild-seuche, rabbit septicæmia, chicken cholera, etc., is a difficult and perplexing one which has not been satisfactorily settled, notwithstanding the large amount of labour devoted to it. In solving the problem we must take into consideration not only laboratory experiments but also the careful study of the natural diseases caused by the bacteria in question.

THE DIAGNOSTIC VALUE OF TUBERCULIN AND ITS EMPLOYMENT IN COMBATING BOVINE TUBERCULOSIS.*

BY PROFESSOR BANG, VETERINARY SCHOOL, COPENHAGEN.

IN Denmark, tuberculin has been largely employed as a means of diagnosis. I have personally made numerous injections, and more than 150 autopsies of animals which have been submitted to injection; while as Chief Veterinary Surgeon to the Government I have had before me all the reports made by Veterinary Surgeons on this subject. I may therefore be permitted to give, firstly, a *resumé* of these investigations with regard to the diagnostic value of tuberculin.

I know of 300 autopsies of animals, more particularly bovines, which had been injected; and of this number I find that 36, or rather more than 9 per cent. have not given satisfactory results. But we would be justified in eliminating a large proportion of these cases. In 107 cases the injections were made under unfavourable conditions at the abattoir, on animals which had travelled long distances and were exposed at the market all the day; and this series has not yielded such good results. In other cases, dating from the commencement of my investigations, the dose of tuberculin employed was too small; and in others, again, there was certainly a rise of temperature, but so trifling that no decision could be arrived at.

If I eliminate these doubtful cases there remain 272 autopsies, and of this number I only find 9—that is, a fraction over 3 per cent.—which have not verified the results of the injection.

Consequently, I can assert that tuberculin, when employed in a satisfactory dose and in favourable circumstances, permits a precise diagnosis of tuberculosis in 96 per cent. of the cases; and when reflecting that it acts in this manner in cases the majority of which are those of only slightly developed tuberculosis—altogether insignificant and often limited to some small nodules hidden in the substance of lymphatic glands—we cannot too highly appreciate tuberculin as a means of diagnosis, if we cannot declare it to be infallible.

The errors are of two kinds. In very rare instances the autopsy is made of an animal which exhibited an undoubted

* A memoir read at the International Congress of Hygiene and Demography held at Budapest in September last.

reaction, and yet did not show a trace of the disease. I have observed two cases of this kind. But it should not be forgotten that the autopsy of an animal whose flesh is to be sold as food, can never be made in a complete manner. It is true that we may examine those organs which are usually the seat of tuberculosis, but we cannot deny the possibility of tubercular deposits in some other part of the body; indeed, it is possible that the most experienced observer may fail to perceive small granulations which are deposited in the lymphatic gland of a fat ox.

A little more frequently we find at autopsies tuberculous affections in animals which, during life, did not show an amount of hyperthermia sufficient to warrant the conclusion that tuberculosis was present; but in the majority of such cases the tubercular deposits are very small and old (calcified), so that their virulency may be doubtful. In other cases, again, the animals are very badly affected, and the tubercles are disseminated in nearly every organ; in these the absence of reaction is without value from a practical point of view, because the clinical signs suffice to form a diagnosis.

There is yet a circumstance in which reaction sometimes fails, and this is when the test is repeated; this may happen not only when we repeat the injection a short time after the first reaction, but when it is repeated at the end of a year. This default of reaction I have found in twenty of the eighty animals which formed the sick division in a large dairy, the entire establishment of which I examined.

In order to ascertain whether recovery had taken place, four were slaughtered, and these were all found tuberculous; in three the deposits were very ancient and small, and in the fourth the disease was not so extensive, yet not slight, and the appearances were not such as to warrant the belief in progressive recovery. Consequently, I came to the conclusion that it is well to rely upon the first reaction when a dairy has to be divided into a healthy and a diseased section.

Tuberculin having been recognised as an excellent means for the early diagnosis of tuberculosis, it becomes necessary to discover the best way to employ it in combating that disease in bovines.

As contagion plays the principal part in the propagation of tuberculosis, the first thing required is the examination of all the animals in a dairy by means of the tuberculin, and the placing of the healthy in a shed apart from the tuberculous. But what is to be done with the latter? Is it absolutely necessary to fatten them rapidly and prohibit breeding from

them, as Nocard insisted upon at the Third Congress on Tuberculosis held in the past year?

This question is of great practical importance, because it is an undoubted fact that in the large dairies, when tuberculosis exists in them, it is so prevalent that the number of cows which give a hyperthermic reaction may be as high as 80 per cent. It is therefore evident that it must occasion an enormous loss to the proprietors to slaughter a large majority of their best milch cows, and to deprive them of the possibility of maintaining their stock without buying more—a matter of great importance when the cows are good. In my opinion such a course is much too severe. Why not keep for years those cows which are apparently healthy, and do not exhibit the least sign of tuberculosis except the febrile reaction after injection? And why, also, prevent their breeding? The great majority of such cows are only affected in a very slight degree; a good many of them have only some small nodules in the lymphatic glands, and there is no reason to believe that tuberculosis would rapidly develop in such animals. Frequently enough the disease remains limited for years, and in some it is even possible for recovery to take place; at least I have very often found small and perfectly calcified tubercular deposits in aged cows. Such cows might give birth for years to absolutely healthy calves. I am inclined to attribute to direct heredity—that is, contagion from mother to fœtus—a larger share in the propagation of tuberculosis than Nocard does. Up to the present time I have examined twenty cases of tuberculosis in the fœtus and newly-born calves, but the disease is never transmitted to the fœtus unless the mother is in a very advanced stage of the disease—probably always generalised. When the cow is only slightly affected the calf is always born healthy.

I am therefore of opinion that all the tuberculous cows, apparently healthy, should be kept, and allowed to breed; but, at the same time, they ought to be well separated from healthy animals, and their calves should be removed from the infected sheds immediately after their birth. The use of the uncooked milk as food for the calves should be absolutely interdicted. This is a matter of great moment, on which my investigations in late years have thrown much light. The autopsies of calves which were shown to be tuberculous by test injection, have demonstrated that the majority were infected through the alimentary canal—in all likelihood by raw milk. Among thirty-five calves belonging to large dairies, I have found the tubercular lesions in twenty-four

exclusively, or at least predominant, in the retro-pharyngeal or mesenteric glands; and a good number of autopsies made by others have yielded the same result. It is, therefore, absolutely necessary to interdict the use of uncooked milk for the calves, and I am convinced that this very simple measure would get rid of a large portion of bovine tuberculosis. It is true that new-born calves cannot very well get through the first few days of their existence without the colostral milk, but already, on the second day, they manage very well on cooked milk. With regard to the colostrum, it may not be boiled, but it can be heated to 65° (Cent.?); this temperature will not kill the bacilli, but it will diminish their virulence. I am in the position of being able to demonstrate by practical experience the truth of these assertions.

Two years ago I began an experiment, having for its object the successive purification of a large dairy in which tuberculosis was present. This was on an extensive farm in Seeland, and contained 208 cows of the red Danish breed. For two years cases of tuberculosis had cropped up, but only in the majority of the large sheds, and there were very few of the animals which did not appear to be quite healthy. Nevertheless, when tested with tuberculin, 80 per cent. of the milch cows, 40 per cent. of the bulls, and 40 per cent. of the calves and heifers gave a febrile reaction. After a careful disinfection, I divided the shed by a wooden partition, and the people who attended to the diseased were not allowed to enter the portion where the healthy animals were kept, and *vice versâ*; every possible care was also taken to prevent all communication between the two divisions, directly or indirectly. It was decided to rear the calves from the affected cows, as well as those from healthy mothers. Immediately after their birth, the calves were removed to a clean stable, and after the second day they were fed on boiled milk; and in order to get rid of creatures which were tuberculous at birth, I tested by injection all those of a few weeks old; but up to the present time none of them have been found diseased.

Each year I have twice tested the animals in the healthy portion of the sheds with tuberculin—in the spring before being turned out to pasture, and in the autumn immediately after being housed. The first year the separation between the two portions of the cowhouse must have been insufficiently maintained, for the injection on each occasion produced an elevation in about 10 per cent. of the animals which had been put into the healthy part. It is needless to say that these

were segregated at once. At the autumn testing, eighteen months after the commencement of the experiment, only one animal of 107 showed hyperthermia, which was very slight; and the testing this spring has rendered two of 122 animals suspected of tuberculosis. None of those born on the farm after the commencement of the experiment, and whose mothers, for the most part, belonged to the diseased section, have shown any febrile reaction during these two years. It therefore seems to me to be demonstrated that it is possible to rear a healthy herd on a farm where there is an infected herd, the two being only separated by a wooden partition, and that this will prove successful even when the calves from diseased cows are reared. Here, then, is the most natural and least costly way to get rid of tuberculosis.

This experiment was made at the expense of the State, but the Danish government has done much more to assist the owners in their combat against tuberculosis. Since 1893 we have a law which places at the disposal of the government for five years an annual sum of 50,000 kroners, to help those who are desirous of making use of tuberculin. Since 1893, all the tuberculin employed in Denmark has been prepared in my laboratory. On the condition of being able to satisfactorily separate the diseased from the healthy cattle, owners can obtain gratuitously the testing of their stock by a veterinary surgeon, who is paid to make the injection, and take the temperatures before and after the operation. According to the law, it is only the young animals which are tested gratuitously, but the owners who desire to have all the herd tested, may have this done at a very small expense, and I, who distribute the tuberculin, favour the application of this measure as much as possible, especially in moderate-sized dairies. In the majority of the peasants' cowsheds, this measure is resorted to.

Up to the present the test has been applied on 327 farms containing 8,401 animals, of which 3,362 have shown the febrile reaction. I will not mention all the results that may be drawn from these experiments, but will cite a few.

It has been found that tuberculosis is distributed in a very different manner in the various parts of the country. It is much more prevalent in those localities—as might have been predicted—in which cattle are often changed than in those where they are not renewed. It is, in general, more prevalent in large dairies than in moderate-sized ones, and among milch cows than among young animals. The number of animals affected in a stable also differs widely; often the

number is terribly high, in others it is very small, and especially in the peasants' cowsheds. But what to me appears to be of the greatest interest, is the large number of dairies which are perfectly healthy. At present I know of fifty-two, in which the number of cows varies from ten to forty-two.

The existence of a large number of herds, absolutely healthy, in a country in which the disease is wide-spread, distinctly demonstrates that the hypothesis of the ubiquity of the tuberculosis bacilli—a hypothesis which would paralyse all efforts to extirpate bovine and human tuberculosis—is false.

THROMBOSIS OF THE ILIAC ARTERIES IN THE HORSE.

BY R. RUTHERFORD, F.R.C.V.S., EDINBURGH.

THIS lesion, the leading features of which afford a most interesting, clinical and pathological study, is one which is not very often recorded. I have much pleasure, therefore, in sending you the following notes of two cases which occurred recently in my practice:—

Case I.—A middle-aged heavy draught gelding, in yoke for first time after purchase by a poor man. After going at a walking pace for about half a mile, was observed to have a difficulty with his left hind leg, and in a minute or two fell. The cart was detached and the harness taken off, and the usual methods were adopted to get him on his feet again, but without success. After working at him for over an hour, his owner came and asked me to advise in the case.

I found the animal lying on his right side, head down hill, blowing and sweating profusely over the neck and body, struggling at intervals to rise, lashing out with his fore feet, but with little movement of the hind extremities. I found that in his attempts to rise he had pitched forwards and downwards, the street being on an incline some fifty or sixty yards, and on inquiry found that he had not been able to get up properly behind.

I made one attempt to get him up, but failing, sent for a float in which to remove him home, or at any rate off the street.

I need not say that, as usual in such cases when they occur in a busy thoroughfare, quite a crowd had gathered and that there was the usual amount of gratuitous opinion as to what was wrong and what should be done. For my own

part I am free to confess that at first I was not at all clear about what was really wrong; it might be one of several things. Horses go down from many causes, dorsal, lumbar, pelvic fracture, and other injuries, and quite recently I had seen a harness horse that defied every effort to raise him off the street, that had to be floated home, and which on being raised in slings was found, so far as we could ascertain, to have nothing serious wrong with his back. He had, however, old standing disease of his hocks, and I found on inquiry that he had a difficulty in the stable in raising himself on his hocks.

But while waiting on the float, on which I wished to see the animal placed myself, I was struck by the probability of what was wrong from the following symptoms:—He did not move his left hind leg at all and the right one but very little; further, the left leg from the hock down was deathly cold, the right one less so but much colder than usual, and what was most important, as time passed, I noticed that the area of coldness extended upwards, travelling towards the quarters both of which finally became like the legs quite *cold and insensitive*.

On the arrival of the float he was got on to it, taken home, and drawn off it again on to a comfortable bed with very little trouble, considering his weight and helplessness.

The posterior bowel being thoroughly emptied I was able, on passing my hand and arm sufficiently forward and into it, to verify my fears—that the case was one I could do nothing for. My examination of the parts gave rise to pain, evinced by the animal's groaning and straining. The termination of the post aorta and the iliac arteries could be distinctly felt, and I was able to satisfy myself that on the left side especially there was plugging of the internal iliac. It is worth while recording that although, as was demonstrated *post-mortem*, the iliacs on both sides were found to be occupied by thrombi, which was continued a short distance into the aorta, there was a pulse wave, very quick and strong, in the aorta, and although very feeble and indistinct in the left internal lilac, still sufficiently present to throw one off his guard. One would hardly expect a pulse wave in the presence of a thrombus; such however is present, and no doubt is partly owing to an impulse communicated by the aortic column of blood and partly by a very small stream of blood passing at the same time into the vessels or meshes of the thrombus.

I have said that the horse had been newly purchased, and

that by a poor man; it will not therefore be a matter of wonder that his owner, even in the face of my opinion (about which I could hardly, under the circumstances, find fault with him for being somewhat sceptical), was most anxious to try and raise him on his feet. Slings were passed under him, and an attempt made to get him up, but it was no use. He could put no weight on his hind feet, nor indeed in the slightest degree use his hind extremities; reluctantly, therefore, he was lowered again on to his bed, and he died in considerable agony a few hours afterwards.

Case II.—I am able fortunately (in a sense only), to give the history and record the progress of this case somewhat fully.

He was a six-year-old, well-bred, saddle and harness horse, property of and purchased into the service of Messrs. Neaves and Son, jobmasters in this city, about two years ago. During that time he had on no single occasion been specially amiss, and this last summer carried Mr. Neaves, Junr., through his duties at the Yeomanry Cavalry outing at Dunbar, where, I understand, his work was heavy. He returned from Dunbar I think on July 7th apparently all right, and remained so up till July 24th, on which date he was reported to me as having something seriously wrong with his back.

He had been out for a turn in harness, but the driver noticing he was seriously amiss quickly brought him home again. I found him blowing, sweating profusely over the body, and swollen—as if from local cramp of the muscles—under the saddle, stiff in his movements; no elevation of temperature but pulse increased. He looked like a very mild case of so-called azoturia; at any rate there was distinct muscular cramp and loin stiffness, and for this he was treated by hot fomentations and a dose of physic. In two or three days he was all right, not a sign of the least thing wrong about him; nevertheless he was not put to work but was simply exercised, carefully dieted, and kept for a few days under observation, and was finally removed out of hospital.

On being sent for a turn in the light break, he again in a few days was observed to have some difficulty with his right hind leg, then he began to blow and get stiff about the back and was brought home again; the hot fomentations were re-applied and shortly he was all right again.

This occurred twice without my seeing him, but on a fourth occasion I found him exactly as he was on the first occasion of my seeing him—with this addition to the symptoms—that there was very marked irregularity of the heart's action, and

I had little difficulty in concluding that there was some obstruction in his aortic circulation, although on examination nothing definite could be felt.

He was rested, and the cardiac difficulty disappearing he was given on trial to a prospective purchaser, but brought back after failing to complete his first journey. I did not see him when returned, but on the following day I did, but his alarming symptoms had all passed off. It was now observed that he passed very little urine, and on further examination there was again the cardiac irregularity with hind legs cold below the hocks, even although they were warmly bandaged. His spirits and appetite were still good, temp. normal, and to look at him one would have said there was little the matter with him. As, however, I was now determined to have a thorough examination of him, and as I had never seen him fall lame, which had always been reported of him at each attack, I arranged to do so on September 11th last.

He was saddled and a man put up, walked about the yard for five minutes or so, but showing nothing, and the yard being at the time somewhat crowded, I had him taken out to the street and trotted. He hadn't gone above 500 yards when I noticed him suddenly falter on his right hind leg; he lost control over it. In a few more yards, at a walk—for I at once had stopped the trot—the left hind became involved, he began to blow and show distress, and although he had only some 60 yards or so to go to reach his stable, he did so with great difficulty, walking in a crouching manner, as if the fore and hind feet were all at fault, and evidently in great pain.

The instant he reached his loose box down he went, his back swelled as before, his belly was tucked up, and he groaned continuously and sweated profusely over the body, fore extremities, and neck. This was at 3 p.m., and for fully two hours he remained in terrible and continuous pain, rolling occasionally half over on his back, poking his nose into his flanks, making a sort of bite at his hind fetlocks, with frequent attempts to rise. At first he could do so, but he could not stand level, and as it was he could only remain up till he turned round in his box, then down again, to be followed by another attempt, which he was gradually becoming less able to complete. He very shortly could only raise himself sufficiently high to turn over on his bent-up legs from side to side.

Hot fomentations were attempted, and morphia being subcutaneously injected, he gradually became somewhat quieter, groaning and sweating less, but quite unable to rise.

Although he knocked his forelegs a lot about, there was little or no movement of the hind legs, both of which were deathly cold from the hocks down, insensitive and cold above. The sweating was confined entirely to the body—in front of the croup—behind which the skin was cold, dry, and the muscles tremulous. When he was sufficiently quiet, I examined him per rectum, and was quite able to satisfy myself that there was aortic and iliac thrombus. There was the same resistent feeling when the vessels were gently pressed upon; the same pain evinced by groaning and straining; the same peculiar aortic pulse, quick and thumping, with the indistinct wave impulse into the internal iliacs, that of the right side being much weaker and more indistinct than that of the left side. It will be remembered that it was the right leg he always fell lame upon.

As the night advanced he became much quieter, only at long intervals having pain, which when it did recur seemed to be very severe, and he drank a little water and took a very little mash. Although I had absolutely no hope of him he was left for the night fairly comfortable with another dose of morphia subcutaneously administered. He remained fairly quiet till about 3 o'clock the following morning, when, after making a few ineffectual attempts to rise, he again became very violent, lashing about with his fore feet and raising the fore part of his body, only to fall back again. I saw him at 5 a.m. and found him dying; hind quarters and legs cold, pulseless at the jaw. He died at 6 a.m., 15 hours after the attack. Throughout the attack there was never more than 1° elevation of temperature.

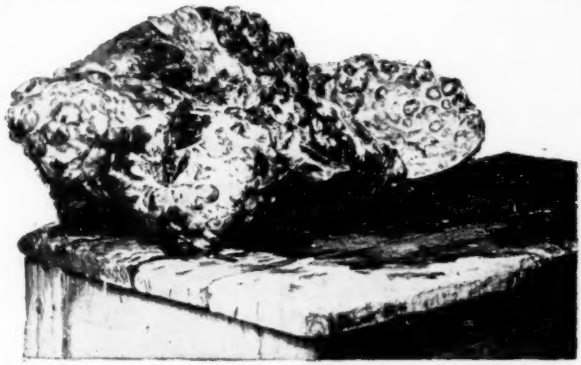
The *post-mortem* examination disclosed thrombus of the extreme end of the post aorta, of the right external and internal iliacs, and of the left internal iliac, a patch of inflammation of the sublumbar fascia above the aorta, with exudate, and inflammation of the inner coats of the vessels involved. The most interesting point in connection with the thrombi was that they were apparently of different ages, the most recent being that of the right external iliac, which from its appearance—a dense, fresh blood clot mainly—was evidently the product of the last attack.

ENORMOUS HYDATID LIVER.

BY J. H. CARTER, F.R.C.V.S.

I ENCLOSE a photograph of an enormous hydatid liver taken from a cow slaughtered at the Burnley Abattoirs a few weeks

ago; it presents unusually interesting features which may be worthy of publishing in the valuable VETERINARY JOURNAL. I here append a few particulars respecting the behaviour of the beast prior to being slaughtered. The cow was four years old, and travelled by road 16 miles to Hawes station, before being trucked to Burnley. Upon her arrival nothing whatever unusual was noticed excepting her very wild behaviour. She was ultimately dispatched in the usual manner, and it was not until the abdomen was opened that any suspicion of disease was aroused. The liver, as will be seen upon examination of the photograph, was nothing less than a conglomeration of hydatid cysts, and upon section was simply honeycombed throughout its entire substance. Very little



indeed of the original structure was to be found. It scaled the enormous weight of 110 lbs. The lungs were similarly affected and weighed 46 lbs. Needless to say the carcase was condemned.

THE EFFECT OF AGE ON THE ORGANS OF THE HORSE.

BY J. T. DUNCAN, PROFESSOR OF ANATOMY, ONTARIO VETERINARY COLLEGE, AND IN THE WOMAN'S MEDICAL COLLEGE, TORONTO.

IN the dissecting room of the Ontario Veterinary College, it has been our custom for some time back, carefully to weigh each separate organ of every subject. A printed form is issued with spaces for entering such weights, as well as other particulars. As dissection proceeds, the weights are entered in their proper spaces by the Secretary. When the subject is

finished, the filled-in form is returned to the College and kept for future examination. At the close of the session the averages are made up. In this way we have the weights of the right and left lungs, heart, liver, spleen, pancreas, right and left kidneys, and brain. By this plan not only are habits of exactitude fostered among the students and the memory aided in regard to the weights of the organs, but we also have interesting data to compare with those given in the standard text-books.

I have only as yet made up the returns from a portion of the work of two sessions. The cases, however, have not been selected; they are consecutive and up to date.

In order the better to compare our results with those from standard works, I shall place them in parallel columns. Those in the first column are from that admirable French work (translated by Dr. G. Fleming), viz.:—Chauveau's "Comparative Anatomy of the Domesticated Animals." The column showing the number of subjects and the last column of weights, are from the returns of the Ontario Veterinary College:—

	Chauveau.			*O. V. College.*			
	lbs.	oz.	dr.	No. of Subjects	lbs.	oz.	dr.
Heart	6	12		89	7	3	
Liver	11			92	9	7	
Spleen		32		89		34	8
Pancreas ..		17		78		14	12
Right kidney ..		27		87		24	8
Left kidney ..		25		86		22	4
Brain		22	15	74		23	4

Chauveau's work gives no idea of the number of horses examined, but makes it clearly understood that the weights published are from healthy middle-sized adult horses.

On the other hand, it must be remembered that the returns from this college are from dissecting room subjects.

Horses sent to the dissecting room are, as a rule, aged animals. Chauveau's figures, then, are from full-grown but not aged subjects. Ours, on the contrary, are from old and generally worn-out animals. As to size, ours were probably an average lot.

What effect upon the weight of the different organs would the discrepancy in age be likely to produce? Speaking generally, it may be said that the organs atrophy with age. The heart is an exception to this rule. Figures from this college, then, should show all the organs to be lighter than those given in anatomical works, except the heart. Taking the organs separately, we have for consideration:—

1. *The Heart.*—This organ in the college series weighs seven ounces (nearly half a pound) heavier than Chauveau's figures give. This is not surprising, as the tendency of the heart is not towards atrophy, but rather to increase both in bulk and weight as age advances.

2. *Liver.*—This gland, at the second month of uterine life, constitutes about one-half of the entire weight of the body; at birth it is about 1 to 18, while in the adult it is not more than 1 to 40. These figures refer to the human being, but the discrepancy is even greater in the horse. In the adult horse the proportion is about 1 to 80 off the weight of the animal. These figures emphasise what has already been stated as a general law, viz., that age causes atrophy. By referring to our weights it will be seen that the liver of the aged horse is 1 lb. 9 oz. lighter than that of the adult.

3. *Spleen.*—The tendency of this organ is very decidedly to atrophy with age, yet we find our figures show the spleen of the old animal to be 2½ ozs. heavier than that of the adult. To explain this is not easy. It may be due to accident; thus, if one case of considerable hypertrophy were to be found among our subjects the average weight might be very materially increased. But in looking over the returns I find no such case. Out of the 89 cases tabulated, 8 weighed 3 lbs., and only 2 were as high as 3¾ lbs. On the other hand, 8 weighed about 1½ lbs., 2 were 1¼ lbs., while the lowest weight recorded is one case which only weighed 1 lb. Taking the average weight at 2 lbs. (32 oz.) the variations noted above are not excessive, and would negative the idea that one or two hypertrophied spleens had vitiated the average.

4. *Pancreas.*—This gland is known to atrophy greatly in many aged horses. The college figures show it to be nearly 2½ ozs. lighter in the aged than the adult animal.

5. *Kidneys.*—In the old horse the right kidney weighs 2½ ozs., the left one 2¾ ozs. less than in the adult. This would seem to be the result of age, and the atrophy evidently affects both to the same degree.

6. *Brain.*—This organ almost more than any other shows the effect of age. I am not aware of any figures giving the proportionate loss in the horse, but the brain of man loses about 1 oz. in weight for every ten years after the age of forty. We would reasonably expect, then, to find the brain lighter in the subjects from which our figures are taken; instead of this, we find the aged brain to be heavier than that of the adult by about one-third of an ounce. I shall not attempt any explanation of the figures.

Speaking generally, our figures tend to confirm those of Chauveau, and also to illustrate the effect of age upon the various organs.

THE SPECIFIC FEVERS OF MALARIAL ORIGIN IN EQUINES.

BY VETERINARY-CAPTAIN J. A. NUNN, D.S.O., F.R.C.V.S., PRINCIPAL OF THE LAHORE VETERINARY COLLEGE.

VETERINARY Surgeons who have practised in tropical climates, and particularly military veterinary officers who have served in India, have in most instances had to deal with outbreaks of disease amongst equines.

Sometimes these disorders assumed an epizootic character, and at other times they were of only limited extent, such as those universally classed as anthrax.

The symptoms observed in these outbreaks have been described over and over again in the various professional periodicals, and are so well known that is is needless to recapitulate them; but after considerable experience in various parts of the world, a doubt has for some time past been present in my mind as to whether, in many instances, we are not in error regarding our diagnosis, and that we are too ready to jump to the conclusion that the malady in question is anthrax. The reasons I have for this doubt are almost entirely speculative, and are not supported by much proof or experimental research; and I am inclined to offer these few remarks in the hope that they may lead to some ventilation of opinions on the matter.

The first thing that caused me to entertain any such doubts was an investigation into the South African horse-sickness, on which I was engaged in the colony of Natal, in 1887-88. This disease, which has given rise to much discussion, has been frequently described, and in all professional works was stated to be anthrax, no doubt as to the correctness of this being ever entertained. A detailed account of the investigation was published in the VETERINARY JOURNAL at the time; but all that I was able to arrive at, was that the disease was not communicable from one animal to another of the same or different species, either naturally or experimentally; that, when cultivated, the microbe of this disease presented a peculiar development; and that this microbe, which was found in the blood, under the microscope showed marked differences to the anthrax bacillus. I therefore came to the conclusion that South African horse-sickness was not anthrax, whatever else it might be.

At Calcutta, in 1889, while in conversation with Veterinary-Captain Blenkinsop, A.V.D., who was then in charge of the Remount Depôt for newly landed Australian horses in that city, we found that there was considerable mortality among them shortly after their arrival in India, and that by tradition this mortality was always attributed to anthrax.

Now, as is well known, the anthrax microbe must find its way into the current of the blood in order to produce any effect; and the manner in which this is effected is either by direct inoculation, through the respiratory organs, or through the digestive tract. But for all practical purposes the first may be set aside as being beyond the bounds of probability. The medium by which the microbe is conveyed to the system is either the air, the food, or the water. Now, as the voyage from Melbourne to Calcutta occupies about twenty-eight to thirty days, and the usual period of incubation of anthrax at the longest is about seventy-two hours, we came to the conclusion that if the disease were anthrax it would make its appearance at the commencement of the voyage, and would be epizootic in its character; whereas here it only occurred in isolated or sporadic cases, and after the horses were landed, or within the last few days of their being at sea.

Veterinary-Captain Blenkinsop and myself made several *post-mortem* examinations, and although we carefully searched, we were quite unable to detect the anthrax bacillus in any one instance. A most marked feature was the condition of the intestines. In all those examined there was a congested state of the mucous membrane, more especially in the cæcum and vicinity of the ileo-cæcal valve, with exfoliation of the mucous membrane in shreds and patches of ulceration chiefly in the neighbourhood of the valve. In two cases that have come under my observation, there has been perforation of the intestine.

The ulcers have a peculiar appearance; they have raised margins, and more closely resemble the ulcer of human enteric fever than anything else, except that the ulceration appears to extend laterally and not vertically; and although the area of the ulcer is large, it is not so deep as that of enteric fever of mankind. This may account for the rarity of perforation, which would undoubtedly take place oftener if the ulcerative process chiefly extended into the substance of the bowel.

A marked feature was the presence of the yellow, jelly-like infiltration into the tissues, which has been usually looked upon as indicative of anthrax—though from this opinion I am

inclined to differ, because I consider it more a sign of febrile disturbance, and not one of anthrax in particular, as it was almost invariably present in the Natal horse-sickness. During life there were the usual constitutional febrile symptoms in all these cases, with a distinct morning and evening rise and fall of the temperature.

Since I have been at the Lahore Veterinary College, cases of this kind have been admitted to the hospital, and in those that succumbed to the disease the same appearances in the bowels have been noticed as in the Calcutta cases. A series of observations was carefully conducted by Veterinary-Captain Blenkinsop, who was then a professor in the college. The line of treatment adopted was: reduction of the temperature by antipyretics, such as antifebrine or phenacetine, followed by quinine or arsenic; regulation of the bowels by salines and enemas; diffusible stimulants when necessary; and, what was more important than all, stoppage of all solid food of every sort and description. The patient was put entirely on a milk diet to the extent of three or four quarts daily, with beef tea and beer or porter if indicated.

Since this treatment was adopted the results have been most striking. Our argument was, that if intestinal inflammation or ulceration were present, the usual treatment adopted by farriers "and other persons who are often in charge of horses in this country," of giving a violent aloetic purgative, with a diet of bran-mash and hay, was simply aggravating the disease; as the aloes and solid food would be nothing more than irritants, and would either increase the inflammation or, in the case of ulceration, cause perforation.

A number of careful observations were made by Veterinary-Captain Blenkinsop, with regard to the temperature. He found the state of hyperpyrexia ran in periods of about eight days, "with a regular morning and evening rise and fall," and that after the eighth day there was a crisis.

From these facts I am inclined to think that a certain number of such cases terminate unfavourably, because of the administration of aloes and allowing solid food to be eaten; and it not being noticed that the animal had been previously unwell, death is believed to be sudden; and at the autopsy, the yellowish, gelatinous fluid being found, the conclusion arrived at is that the case was one of anthrax.

That solid food has a detrimental effect is proved by the fact that in some of our earlier cases, "before we recognised that the period of hyperpyrexia was eight days," the milk

diet was stopped too early, and the return to solid food caused a relapse, with a rise of temperature.

From a considerable experience in tropical climates, I am of opinion that solipeds are much more liable to malarious influences than is generally supposed, more especially imported animals. In India the country-bred horse of to-day is a differently constituted animal to that of forty years ago, and is therefore more susceptible to the influence of climate on account of the large admixture of foreign blood.

Many of us are old enough to remember that twenty-five to thirty years ago, enteric or typhoid fever was unknown in human medicine, but that low fever was an everyday occurrence; and it was not until Jenner, Budd, and Murchison had worked at the subject that enteric fever was recognised. It would almost appear that the veterinary profession is in somewhat the same stage as human medicine then was, and that the fevers to which the horse is subject, "especially in tropical climates," have not yet been sufficiently studied, so as to be clinically differentiated, and that these fevers are too readily classified as anthrax. I do not for a single instant contend that anthrax does not exist; but I am strongly of opinion that, in India at all events, it is not nearly so prevalent as it is generally supposed to be, and that if the subject is properly and thoroughly studied it would be found that the horse is liable to more than one variety of specific fever, which is now classified in official returns and reports as anthrax.

THE SURGICAL TREATMENT OF PUMICED FOOT.

BY GEORGE FLEMING, C.B., LL.D.

AT a meeting of the Central Veterinary Medical Association, during one of the years I held the office of President, at its commencement, I drew attention to the success that had attended my treatment of what is vulgarly termed "pumiced foot," or, in some cases, "dropped sole." I was then veterinary surgeon in the Royal Engineers, but the cases I experimentally treated were not army horses, as these never have "pumiced" feet, but belonged to owners in and around Chatham, where I was stationed for a considerable period. The treatment devised and carried out at that time was so markedly successful, that I brought it to the notice of the society just alluded to; and I now recur to the subject, as I do not think the procedure has been adopted—to any extent,

at least, and since then I have seen in London and elsewhere, instances of this condition shod on the old-fashioned principle, which might have been greatly benefited, if not cured, by the adoption of the course of treatment I had tried and recommended.

Into the pathology and results of acute laminitis it is not necessary to enter here; so suffice it to say that "pumiced foot" is the consequence of acute laminitis improperly treated, which leads to deformity of that organ. This deformity is brought about by the effusion and exudation that takes place between the podophyllous and keraphyllous tissue, more particularly at the anterior and lower part of the foot or wall. The exudate in time becomes transformed into a somewhat soft horn, not unlike that composing what is known as the "white line," forming a bond of union between the sole and wall. This mass of semi-horny matter is wedge-shaped, the thick end being interposed between the vascular and non-vascular laminæ at the lower part of the foot, and the thin end directed upwards, but not so high as the superior margin of the wall; laterally, it does not usually extend beyond the quarters. The exudate is thrown out from the large podophyllæ around the front and sides of the pedal bone, and when it becomes converted into horn, this pushes the wall forward and the bone backward, leading to dislocation of the two sets of laminæ in this region of the foot, and consequent alteration in the direction of the hoof wall and pedal bone. The displacement of the latter is no doubt increased by the position assumed by the horse—that is, placing the weight of the body on the posterior part of the affected limb or limbs, which has a tendency to pull the pedal bone downwards and backwards, through the insertion of the deep flexor tendon of the foot.

In the course of time, the resulting deformity is very notable, especially with heavy horses, and when the inflammation has been very acute. In some chronic cases the foot is not unlike the shape of a bowl, the sole being convex and far below the level of the wall, from which it is widely separated by a large quantity of loose, non-fibrous horn, variegated in colour, and readily breaking up into powder. Towards the heels there is not usually much change, but in front the wall bulges out as a convexed, ridged mass, its fibres being bent and brittle.

The horse stands badly on the limb, owing to the thinness of the sole, and the proximity of the margin of the pedal bone. Therefore to enable the animal to do any work, the

diseased foot has to be shod in a particular manner. This usually consists in the application of a bar shoe, "dished" in such a way as to receive the sole, but without touching it, and resting only on the margin of the wall and the frog. The wall towards the heels is the only part where nails can be satisfactorily driven.

It is evident that such shoeing must aggravate the evil, as the horse's weight must press the soul deeper downwards, and push the wall further forward, so that instead of improvement there is further deterioration.

My treatment consisted in removing the wall as far upwards and laterally as the wedge of horn extended, by means of rasp and knife, cutting as far as I could without wounding the vascular laminæ. Then a thin, light, and flat shoe was put on the sole, and attached by small nails driven

through the wall towards the heels. Before the shoe was put on, however, a layer of compact felt was laid upon the sole, so as to prevent this being bruised by the shoe; the latter was frequently inspected to make sure that it was firmly attached, and it was left on as long as possible. It was remarkable how quickly an improvement took place in the position of the pedal bone, when the obstacle to its replacement was removed. The coronet was blistered, and the horse was put upon soft litter in a loose box, Stockholm tar being applied to the front and sides of the foot, and covered with tow bound to it by means of tar twine. Care was taken as the wall grew down, to keep the horn covering the podophyllæ free from discoloration and cracks. The pressure and strain being removed from these processes the chronic inflammation soon subsided, and the formation of false horn ceased.

Since then, another method of treatment has been introduced by Hingst, veterinary surgeon at Frankfort, with the object of bringing such deformed feet back to their normal

condition. The principle of this method consists in scooping out all the wedge of false horn, then pushing back the deviated portion of wall until it has assumed its normal slope. To facilitate this procedure, two grooves are made in the wall, in a V-shape direction, as shown in the figure, the upper end of the grooves rising nearly as high as the coronet. So that when the abnormal horn beneath has been removed, the wall can be readily bent back. Then a shoe is applied to the foot; but it has a kind of arch welded on it that lies close to the wall at some distance from the ground surface, and through the middle of this is a screw, which by its action will drive in the wall and retain it in place. The screw is turned a little tighter each day, so as to act gradually in bringing the wall to its natural direction. This plan of treatment or the one I have described, deserves a trial in such serious cases, and I hope it may receive one. My own experience, for lack of suitable subjects, is limited, but so far as it went it was encouraging.

Editorial.

A RETROSPECT.

TWENTY years ago the integrity of the Veterinary Corporation of this country was menaced by the application of one of the teaching schools for a charter, in which, among other privileges asked for, was power to grant licenses to its students. The discovery of the application was made quite by accident, for though the principal of the school in question was a member of the Council of the Royal College of Veterinary Surgeons, he had given no intimation that such a movement was on foot, and when enquiry was made, it was found that the charter had not only been drafted, but was ready for her Majesty's signature, so that the discovery was made in the nick of time to save the Royal College from destruction. The representations of the Council, made through some of its then influential members, were favourably listened to, and the obnoxious clause was expunged from the charter, which was afterwards granted. This happily-averted danger (which was not the first that had been evaded) drew urgent attention to the fact that the veterinary profession in the United Kingdom was not represented in the world of journalism, and had no means of speaking for itself: the only periodical then existing being the journal of the school which had applied for licensing power, and the profession was therefore at its mercy. By those who were best able to judge, and who had the welfare of the whole body of veterinary surgeons at heart, it was felt that the time had arrived when a journal should be started which should not only be loyal to the Royal College, but would fitly represent the position and progress of veterinary medicine, and give expression to the views and desires of its practitioners. The necessity for undertaking the immediate launching and conducting of the new periodical was earnestly pressed upon us by many of the leading members of the Royal College, and though our leisure was scanty and funds far from plentiful, we at length consented, and in little more than a month from the matter being mooted, and not much more after the escape from danger had occurred, the first number of the VETERINARY JOURNAL appeared. From that time upward, real, and it may be said rapid, progress has been made in obtaining for the veterinary profession that legal, social, and scientific *status* to which it

had never before aspired, or at least had been hitherto unable to secure. The position of the graduates of the Royal College was, twenty years ago, eminently unsatisfactory in every way. The law gave no protection to their title, which could even be, and was, assumed by unqualified persons with impunity; consequently, they had to contend everywhere with empirics who placed themselves on the same level as the qualified practitioner, and successfully competed with him for public support, the public being unable to distinguish between them, and the law courts could not establish a penal distinction. In this respect alone the position of the profession was degrading, while it could not protect itself from the effects of unprofessional or unworthy conduct on the part of its own members, and had to keep their names on its register, no matter how much they had dishonoured it. The Veterinary Surgeons Act of 1881, in addition to the other benefits it conferred, gave the profession a legal basis on which to proceed, and afforded the necessary protection from the inroads of the unqualified, as well as the misdeeds of the qualified.

For years it had been a matter of complaint and regret that, after graduation, practitioners could obtain no higher degree in veterinary medicine than that of member. By the supplemental Charter of 1876, power was obtained to institute the degree of Fellow; and as an inducement to members to study for and receive it, certain privileges were attached to it. The object was to raise, in time, the professional standard of knowledge, and to ensure that the management of corporation business should be in the hands of those who had given evidence of their desire for advancement and their ability to promote it. This step was a most important one, and in the course of years, if properly carried out, must have given a great impetus to post-graduate study, and be an incentive to laudable ambition to seek distinction in this way. The Council for many years was almost entirely composed of Fellows, who managed its affairs so judiciously and satisfactorily that not only was professional education advanced to a sufficient degree without injury to the interests of the veterinary schools or the public, but prosperity was most marked; and so well had the finances been attended to that the funds at disposal became comparatively large, so that the Council soon found itself in a position to provide a creditable habitation, the property of the profession, in which to hold its meetings, carry on its examinations, and transact the other business of the Royal College.

With its material and social improvement, the Royal

College sought to identify itself more intimately with the veterinary profession beyond the boundaries of the United Kingdom, by the institution of Honorary and Foreign Associateships, and the power to confer these distinctions was granted in the same Charter which established Fellowships. Until within the last few years, many of the most distinguished persons in veterinary and other allied departments of science were elected Honorary Associates, and anyone looking at the list will see that in honouring these men by this distinction, the Council was not only doing what justice it could to their merits, but was honouring itself in having such names on its register.

During the last twenty years the condition of the Army Veterinary Surgeon has undergone great amelioration, and not before it was time. His position before that period was, it may truly be said, humble and humiliating and his prospects the reverse of bright. Promotion was painfully slow, and to a considerable extent dependent on deaths and retirements; the rank was inferior to that of nearly every other officer, and the pay was comparatively small; no matter how zealously or efficiently they performed their duties during peace or in the field, their names did not appear in the list of those who were rewarded for their services, while they were denied, among other things, the honourable privilege of appearing at Court with their brother officers. All this has been changed. Veterinary Surgeons in the Army are, when compared with combatant officers, well remunerated; their services are readily recognised and suitably rewarded; their social position has been greatly enhanced; they are eligible for the distinction of the Order of the Bath; and their profession does not debar them from presenting themselves at *levées* at St. James's Palace or elsewhere. Coincidentally with this improvement in the position and prospects of the Army Veterinary Surgeon, has been the improvement in the sanitary condition of troop horses and in veterinary organisation. The English Army has been the first in Europe to free itself from some troublesome equine maladies, and especially from the scourge of glanders, which, not so many years ago, played havoc among the horses. In everything connected with horse management considerable beneficial changes have been introduced, the advantages of which will become more apparent in future wars; in promoting these, the Army Veterinary School, established at Aldershot since 1874, has had much influence, while it has rendered notable service in other directions.

In the period we are considering, the science and art of veterinary medicine and surgery have been raised to a higher level, and have been more closely related to public, or we might say human, medicine. In suppressing contagious diseases among ruminants, veterinary science has been of signal service to the public, and it is capable of doing still more in safeguarding the national health and wealth in this direction. Professional literature has much increased in quantity and quality, and serious *lacunæ* have been filled up by works which serve as books of instruction or reference, not only for veterinary surgeons, but for members of the medical profession. This has been frequently acknowledged, and for the first time in this country has received recognition from a university, which generously bestowed one of its honorary degrees on a representative of the veterinary profession.

In Journalism we can claim to have spared neither pains nor expense to make our venture acceptable to our readers; and though we undertook and have carried on the editorial duties single-handed and under many disadvantages, we have never for a moment faltered in our resolve to make the periodical worthy of the position it had early won and has since maintained. We have kept the profession *au courant* in everything meriting record, and have been the first to announce the great events and discoveries which have occurred in medicine; while we believe we have had a considerable share in bringing about the reforms and improvements alluded to, and have ever been foremost in asserting the rights and claims of the profession to recognition.

The task which we set ourselves has been accomplished, and we have the pleasure of acknowledging, with grateful heart, the valuable help received from contributors, who have so largely aided in bringing about this result.

The VETERINARY JOURNAL was only begun with the view of carrying out certain objects which, when attained, would put the profession in a much better position than we found it; this achieved, we had no intention of clinging to the editorial chair for a moment longer. And now we vacate it with the feeling that our labour and anxiety have not been in vain, and that we may consider the period during which we have unremittingly watched over and promoted the interests of the veterinary profession in this country, as the most prosperous and brilliant in its history. May its future be as distinguished and beneficent.

In making a valedictory announcement, it is necessary to

add that though we are, editorially, dead, the JOURNAL still lives, possessed of all its vitality and scientific spirit, and that, under the direction of a much more competent, but perhaps not more enthusiastic editor, with more resources at command, it will continue its useful and independent career, it is to be hoped, for a long term of years, when our humble efforts to advance a most important division of medicine will have become lost in the mists of oblivion. *Le roi est mort. Vive le roi!*

A FEW NOTES ON THE DENTITION OF BRITISH MAMMALS.*

BY THOS. B. GOODALL, F.R.C.V.S., CHRISTCHURCH.

THERE is no branch of natural history so profoundly interesting or more fascinating than the study of the dental appendages of ourselves and of the created beings, living and extinct, by which the world is or has been inhabited.

On account of the density and indestructibility of the structures of which they are made, they are often the only guides by which we can form a conception of the forms of beings that have ages ago ceased to exist—they being, in many instances, the only parts preserved from the wreckage of the dim past. From these traces being slowly brought to light, we are able to take note of the gradual specialisation of families from a once generalised type.

A knowledge of the structure and of the conformation of the teeth also enables us to tell at a glance somewhat of the habits of those animals which are our contemporaries here and elsewhere on the face of the globe.

Let us understand first then—*what a tooth is.* It has nothing to do with the horny skeleton, but is a dermal appendage specialised for certain purposes—in the same manner as the nails, hairs, and horns of some animals are dermal appendages, specialised for their functions.

They are found in many forms in the region of the commencement of the alimentary canal in most animals. In some fish they are found about the fauces, or the tongue, etc., and in most reptiles there is a continuous succession of teeth during the life of the animal. Their use is generally for the collection or preparation of food for digestion, though certain of them are used for other purposes, as for sexual warfare.

In mammals they are hard and dense, and are held in position by the growth of bony sockets round their roots; a certain limited amount of elasticity is given them by the interposition between them and the bone of the alveolar dental periosteum.

It is almost necessary to say just a few words about the mode of the building up of a tooth, although in such a paper as this I shall not enter into details.

A young tooth, in its "sac," is found to be in a bony cavity or alveolus—in the bone of the jaw. From the bottom of the sac there is seen to originate the tooth pulp or dental papilla, or, if it is a compound tooth, one pulp for each root and cusp, and over the apex of this is the enamel organ.

From the edge of the papilla, and through the agency of certain cells known as the "odontoblast" cells, the basement of the crown of the tooth is formed, and this, the basement structure, is called the "dentine."

* Subject of a lecture delivered before the Bournemouth Scientific and Antiquarian Society, 10th April, 1894.

Calcification of each of the constituent parts always commences at the apex, and the dentine, giving the outline to the future tooth, is first formed.

Then on the outer side of these pillars or ridges of dentine, but always commencing at the extreme apex, there is formed a coating of enamel, which only extends to the base of the crown, and then the inner wall of the sac, by calcification, becomes converted into a softer substance than either enamel or dentine, and is called "cementum." In human teeth, and in the teeth of the Carnivora, Insectivora, etc., this coating of cement is exceedingly thin; but in the complex and beautifully-formed teeth of some of the Ungulata, it forms a very large proportion of the tooth. In these teeth it is seen to fill-in all the interspaces between the cusps of enamel-covered dentine, and a young tooth has much the appearance of being plastered over with lime. This is most beautifully seen in the young teeth of the horse.

In a freshly-prepared specimen of a young tooth, that part of it where calcification of the enamel organ is most active is of a bright red colour, which becomes white from the apex down, as calcification is completed. In such a tooth the enamel membrane is seen to dry in ridges or folds in the outer aspects of the dentine.

The enamel never extends below the crown of a tooth. The termination of the enamel shows the position of the neck.

A tooth is spoken of as being divided into "crown," "roots," and "neck." That part of it that is free in the mouth above the level of the gum is generally spoken of as the crown; that part in the socket or alveolus as the roots (the term "fangs" is quite an improper one); and the part directly encircled by the gum, between the crown and the roots, is spoken of as the neck.

I may as well tell you at once that this is quite an arbitrary division, and that it only holds good with certain teeth, which are called Brachydont—or short-crowned teeth.

In fact, the crown only is the tooth proper, the roots being merely appendages or supports of the organ in its alveolus or socket, and the neck the part that separates root from crown.

Some teeth have no roots, but are composed only of the crowns; such are the incisors of all Rodents, the molars also of the Arvicolinæ and the Leporidæ have no roots, and are hence termed rootless, or teeth with persistent pulps.

In others, the crown dips down deeply into the alveolus, and is not perfected until the animal has passed maturity, when its base closes, and the roots commence their development—such a tooth is called Hypsodont—or long-crowned, the best existing example of which is the horse.

During the development of all teeth, excepting those with persistent pulps, when the calcified or dentinal basement of the crown is completed, a plate of dentine is formed across the central portion of the base of the tooth, marking the completion of the crown or tooth proper, and from this part commence the appendages or roots—this is seen equally plain in the Machydont tooth of the Carnivora, as in the long Hypsodont tooth of the horse—showing us plainly, irrespective of old notions, what really is crown and what root.

The typical mammalian dentition consists of four series of teeth, though some of these are in many cases suppressed—they are the incisors, canines, pre-molars, and molars.

All our British mammals are, strictly speaking, *Diphyodont*, that is, they have two sets of teeth, a deciduous, or milk dentition, being replaced by a permanent set. The family Muridæ (rats and mice), are in one sense monophyodont, that is, they only have one set, having no deciduous teeth, but they are not by all naturalists regarded as such, but only in the sense of their premolars being suppressed.

The molars are permanent teeth, and are never replaced by others. Generally, the adult incisors, canines and pre-molars replace a deciduous or milk series. When there are four pre-molars, the first is always a permanent tooth, and has no deciduous predecessor, a most instructive fact, as bearing upon the manner of the development of the permanent teeth. This tooth is present in the pig, dog, and allies, and horse, generally in the upper jaw only.

The typical number of mammalian teeth is six incisors, two canines, eight pre-molars, and six molars in each jaw; but to avoid the inconvenience that would be caused by the use of the full terms, we have a dental formula which shortens and facilitates the terms used in describing the teeth.

For this formula the teeth of one side of each jaw only are used, and it is thus explained:—For incisors the letter i. is used, for canines the letter c., for pre-molars p.m. or p., and for molars m. After the letters, the number of teeth is given, those above a line (like the numerators of a vulgar fraction) representing the teeth of the upper jaw, and those below the line (like the denominators) standing for the teeth in the lower jaw. When speaking or writing of the deciduous set of teeth, the letter d. is prefixed to the letters above-mentioned.

Thus the typical mammal dentition is thus expressed:—

Deciduous teeth.

$$\text{d. i. } \frac{1\,2\,3}{1\,2\,3} \text{ d. c. } \frac{1}{1} \text{ d. p. } \frac{1\,2\,3\,4}{1\,2\,3\,4}$$

Permanent teeth.

$$\text{i. } \frac{1\,2\,3}{1\,2\,3} \text{ c. } \frac{1}{1} \text{ p. } \frac{1\,2\,3\,4}{1\,2\,3\,4} \text{ m. } \frac{1\,2\,3}{1\,2\,3}$$

$$\text{Or more briefly d. i. } \frac{3}{3} \text{ d. c. } \frac{1}{1} \text{ d. p. } \frac{4}{4} \text{ (deciduous)}$$

$$\text{i. } \frac{3}{3} \text{ c. } \frac{1}{1} \text{ p. } \frac{4}{4} \text{ m. } \frac{3}{3} \text{ (permanent)}$$

the first numeral always being reckoned from the most anterior part of the series, and counting backwards.

By this method only the teeth on one side are counted; to get the full number of the teeth, this would be doubled.

Of course, there are a great many variations from this type. The Rodentia generally have only one incisor on each side of each jaw (though the Duplicidentata have two in the upper jaw). They have no canines, and the molar series vary, though they never have the full typical number.

The Pecora, or true ruminants, have no pre-maxillary teeth, that is, no upper incisors, and none of our British species except the male red deer (*Cervus elaphus*) have canines, though these are largely developed in the males of some foreign deer, and odontologists are generally agreed in classing the *four* teeth in the anterior part of the lower jaw as incisors, though according to the orthodox formula the fourth should be a canine; but it is so exactly like the other incisors, and fulfils so exactly the same functions, that it must be classed with them. These animals again have but three pre-molars.

The teeth of the horse are of interest, as being the existing type, with the tapir and rhinoceros, of animals whose ancestry can be traced without break to very remote ages. The molars, as I have explained, are of the hypsodont type, the crown extending a long way down into the alveolus or cavity that supports it; and the teeth of the horse are further of great interest as showing the first upper and lower, when present, pre-molar in a rudimentary

or transition state. It is probable that the *horse is about losing this;* it is seen generally much larger in such semi-wild breeds as our forest ponies than in our highly domesticated varieties, where it is sometimes, though not often, wanting.

This tooth is called by horsemen the "wolf's tooth," and its presence is often regarded by the ignorant as affecting the eyesight, and thus being a cause of shying, and it is supposed that the removal of this little harmless tooth will cure a horse of this uncomfortable vice! Does it not show the credulity of man?

In the horse the pulp-cavities close at about ten years of age, and then by the deposition of a cancellated structure at the base, the crown is forced outwards, and the roots are formed.

The *permanent* incisors of the horse are hypsodont, and there is no marked neck between crown and root, and they are unique in having a cup of enamel dipping down into their faces, and it is the appearance of the development and wear of this that enables horsemen to judge the age of the horse at certain periods of its life.

In the Omnivora, Carnivora, and Insectivora, the crown stands up above the gum and is covered by the hard enamel, which at the base of the crown forms a ridge or cingulum, and the roots only are implanted in the sockets. The molars of the Insectivora have numerous sharp points to the cusps for holding and chopping their active and hard or slippery prey, and these are of a **W** or **V** shape.

The teeth of herbivorous mammals are much more complex. In these animals it is necessary that there should be a roughened face to the tooth for *grinding* the hard and fibrous matters of which their food is composed; and this is brought about by the enamel folds extending down into the crowns, thus forming lakes and ridges; thus the dentine bulbs or pillars are coated with enamel, and the spaces between are filled in with the cement. The apex of the cusp of the enamel is worn away when it is brought into use, and then the three substances of different density are brought into apposition during mastication. The enamel being the hardest stands up in ridges above the dentine, and this wears away more slowly than the cement. Thus there is always a roughened face to these veritable and perfect millstones.

All molars have on the faces of their crowns certain ridges and depressions which are designated cusps and lakes, and by the number of these they are styled unicuspid, bicuspid, tricuspid, etc.

The cusps of the sectorial or cutting teeth of the Carnivora, take the form of sharp blades and are called carnapials. A description of these teeth would not be out of place here, because this is one of the methods by which the Carnivora are classified.

In the upper jaw it is always the fourth or last pre-molar; its crown is divisible into two parts, the one a thin-edged blade which runs in an antero-posterior direction, and is more or less divided by one or two clefts into two or three cusps; the other part which is called the tubercle is a shorter cusp, and generally blunt, and is situated on the inner side of the anterior part of the blade.

In those which are the most purely flesh-feeders, the blade is well developed and the tubercle small; an increase in the tubercular character of the tooth is traceable through those genera which are mixed feeders.

The lower carnapial, which is the first molar, is divided into a bi-lobed blade, and a heel or talon. In those animals which are most purely flesh-feeders, the blade is the most developed in some of the Felidæ, in fact, the talon is altogether wanting, whereas the talon becomes larger and the blade less marked in the animals using a mixed diet.

Thus the carnapial teeth of the cat and of the fox are beautifully sharp, whereas those of the badger are blunter and wider.

So also do we find a marked difference between the *molar* teeth (the teeth behind the carnapials) of the different groups of the Carnivora, both in size and shape. Thus in the Felidæ it is but a small rudimentary tooth, in the Corvidæ it is larger, and in the fox is studded with sharp cusps, whereas in the badger it is very large, broad, and tuberculate.

In all the Carnivora there is to be noticed a space in the lingual aspect of the upper "carnapial," between that tooth and the anterior edge of the inner tubercle of the molar, and there is a corresponding depression in the bony palate; the space is for the reception of the posterior lobe of the blade of the lower carnapial when the mouth is closed, and amongst our own Carnivora it is seen to be largest proportionally in the stoat and weasel, next in the cat, next in the dog, next the fox, then the otter, and smallest in the badger, in which animal it is very small, scarcely noticeable.

In all the Mustelidæ, to which family belong our badger, otter, stoat, and weasel, the second lower incisor is placed *back* behind the plane of the first and third, giving the whole the appearance of being wedged in between the canines.

The same is seen to a slighter extent in the position of the alveoli of the incisors of a young dog, though the crowns are level.

In the Felidæ, in which family the incisors are very small, they are always straight across the mandible at all ages.

I notice that the incisors of the polar bear are in the same position as the Mustelidæ; it is therefore probable that the three great carnivorous groups have their incisors arranged differently, viz.:—Œluroidea or cat-like carnivora, the lower incisors are all plane-level; Cynoidea, or dog-like—the second is back from the plane of the others in youth, and the alveoli and roots always a little back, but the crowns are level in the adult; Arctoidea, or bear-like, to which group belong our Mustelidæ, the second crown and root is back from the plane of the others through life.

It is known that the deciduous dentition *mimics* to a certain extent the full permanent dentition, but the mimicry is the most marked in the Carnivora; for instance, the most correct way of describing the deciduous dentition of the upper jaw of the dog would be is. $\frac{3}{3}$, c. $\frac{1}{1}$, and pms. $\frac{3}{3}$, but the pre-molars have the characteristics of one pre-molar, one carnapial, and one molar of the permanent series.

The permanent carnapial replaces both the deciduous carnapial and molar, and is equivalent in size to the two deciduous teeth.

The last deciduous tooth has all the characteristics of the first molar of the permanent series, being broad-crowned and tuberculated, and between this and the deciduous carnapial is the fossa seen between the same teeth in the permanent series.

It will thus be seen that, excepting the carnapial, it is only the second pre-molar that has a predecessor, the first has not; and the third comes into position between the second and the carnapial, being instrumental in the absorption of the anterior root of the temporary carnapial *only*.

In the same way, the fourth deciduous pre-molar of the lower jaw of the dog, though replaced by a more simple type of tooth in the permanent series, has all the characteristics of the permanent carnapial, which is the tooth *behind* it as it comes into position—it will be seen to have the bi-lobed blade and the talon of the permanent carnapial.

In the cat, the deciduous second pre-molars of both the upper and the lower jaws have all the characteristics of the true permanent carnapials, though the teeth by which they are succeeded partake of the more simple forms of the permanent pre-molars; thus, in a two-months'-old kitten's head there will be seen two typical carnapial teeth in both upper and lower jaws, the more anterior one being in the process of being displaced by a more simply-formed permanent tooth, and the posterior one being the true permanent carnapial.

It would scarcely be correct to leave the Carnivora without referring to the long, re-curved, trenchant, and sharp-pointed tooth, the laniary or canine. From its notable prominence in the dog, the tooth found in this position is termed the canine in other mammals.

I would have you notice particularly that the lower one fits into a diastema or space in *front of* the upper one when the mouth is closed, that the teeth in front and behind these teeth are very small, so that there may be no obstacle in the way of the animal piercing and securing its living prey. In the Felidæ the canines are grooved longitudinally.

We shall only glance very briefly through some of the most interesting features of the dentition of the Insectivora. Of all animals they are the most difficult to give a correct dental formula, and there are scarcely any two of our great authorities who are agreed on this subject, the difficulty arising out of which should be called the canine.

In the Talpidæ, or moles, there is a prominent sharp-pointed tooth in each jaw, but they are both distinctly two-rooted, an anomaly in canine teeth. Again, the lower one is fifth in position, and closes *behind* the upper one, and hence it should properly be classed as a pre-molar.

In the Erinaceinæ, or hedgehogs, we are enabled to say which is the canine on account of its position (the first tooth behind the maxillo-premaxillary suture), otherwise it is so much like the teeth in front of and behind it, that it could scarcely be distinguished as a canine.

The dentition of the Soricidæ, or shrews, is very peculiar; in our English varieties the tips of the enamel of the teeth are of a deep orange colour. The first upper and lower incisors are hollowed out on their lingual aspect, gauge-shaped. The upper one has a very distinct second cusp at the base of its posterior border, and the tooth itself is hook-like. The lower one, very firmly adherent to the mandible (said by some to be anchylosed to it), is directed horizontally forward, and has generally two or three clearly defined cusps on its outer edge.

In the Chiroptera, or bats, the canines are very clearly defined, being sharp and spear-like; the crowns of the lower incisors spread out fan-like, and in the edge of each are three cusps; there is a wide space between the two central upper incisors (which is also seen in the Soricidæ and Erinaceinæ). As I have before stated, the molars of all the Insectivora are studded with sharp cusps, and their face has a W or V contour.

The distinguishing feature in the dentition of the Rodentia is their long, curved, chisel-shaped incisors, usually one in each jaw on each side; the upper one has a shorter curve than the lower, and the latter in some, as the Muridæ, is of great length, extending under the molars to the posterior edge of the mandible. They grow from persistent pulps, and the curve protects the growing extremity from injury during their gnawing operations.

The enamel of the incisors is often of a more or less deeply tinged orange colour, deepest in the Arvicolinæ, or voles.

There is a beautiful provision for keeping the cutting edges of these teeth constantly sharp. The hard enamel only covers the anterior part of the tooth (I am speaking generally, there are exceptions), and this resists wear more than the softer dentine that composes the posterior part of the tooth, and hence, as the softer part is worn away the hard enamel stands up, ever sharp.

If by any accident, one of the teeth is broken or destroyed, the opposing one will continue to grow, and as it curves round it obtains a great length, and has been known to cause the death of the animal.

The Duplicidentata (our hares and rabbits), have two little hard plates or teeth behind their upper incisors, which seem to serve the purpose of sharpening the lower ones in the lateral motion of the mandible.

The molars of the hares, rabbits and voles are compound herbivorous teeth, having transverse enamel folds across their faces, and they are rootless, and grow from persistent pulps.

The squirrels, rats, and mice, have tuberculated, rooted molars, thus it would be improper to place the beautiful and harmless water voles in the same category as the rats, or the field voles as mice.

Illustrative of the use a knowledge of the teeth may be, I have always found the teeth of the field vole (*Arvicola agrestis*, which it will be seen are readily distinguishable from the teeth of other small mammals), in the quids of the owl, shewing that this bird of prey is the instrument in Nature, unfettered by the interferences of man, in keeping the numbers of these sometimes destructive animals in check.

None of the Rodents have canines, and the Muridæ have no pre-molars.

And now, just a few words on the teeth of the very important order of the Ungulata. Their teeth show them to be mostly adapted for a vegetable diet—only the Swinæ, or pigs, of our British Ungulates being omnivorous.

The molars of the pig are of the bunodont (or hillock-like) type, and are very markedly brachydont. The molars increase in size from first to the last, the pre-molars being much smaller than the molars, and the last molar being very much larger than the one in front of it (quite twice the size).

The upper incisors are not placed close together, a space being left between each of them. The first is sharply re-curved, and they decrease in size to the third.

The first and second lower incisors stand forward horizontally, and are close together and fluted in their upper surface. The third stands by itself, and is much smaller.

The upper canines curve sharply upwards and outwards, and are much developed in the male.

All the true ruminants have the pre-molars very much smaller than the molars, and they are a simpler type of tooth.

The upper molars are broad and square-shaped, and are quadri-cuspid. Some of them, as I will show, have a supernumerary inner cusp; the outer edges of the crowns are larger than the inner ones, and as the lower ones have the inner edges high and the outer ones low, this facilitates the grinding of their hard food in the lateral motions of the mandible.

The lower molars are much narrower than the upper, and are altogether less massive-looking.

The third lower molar is always tri-lobed, and this is mimicked in the deciduous dentition.

They have no incisors in the upper jaw, and eight in the lower.

The incisors of the Cervidæ and Bovidæ are brachydont. The crowns are chisel-shaped, and terminate with an abrupt constriction at the neck. The roots are rounded, and are not firmly implanted in bony sockets, but in a fibrous pad, giving them some considerable elasticity.

These loose teeth of the ox have often been pointed out to me with much wisdom as being a symptom of a disease called "*tail-soak*," the fibrous pad at the end of the tail being then regarded as loose (which it always is), and this was supposed to be due to the presence of a worm in the tail. The treatment consisted in making a longitudinal incision into the tail, and binding into the wound a red herring or a piece of bacon!

In the Cervidæ the central incisor is much the largest; they rapidly decrease in size to the last, the second, third, and fourth becoming more and more narrow, and having a tendency to curve outwards.

The teeth of the deer are remarkably hard, the cement coating of the external enamel folds sometimes being of quite a metallic lustre.

The molars of the deer are short-crowned or brachydont.

The teeth of the sheep and the goat are much alike, except that the latter are relatively larger.

Their incisors have no marked division between crown and root, and are hypsodont.

There is a very marked ridge running longitudinally down the centre of the outer face of the crowns of the upper molars, which is absent, or not so marked, in the Cervidæ and Bovidæ, and there is not a vestige of a protocone or antero-internal cusp.

The permanent premolars of all the ruminants are small and brachydont.

The crowns of the incisors of the ox are broad, and though the first is the largest, they do not decrease so rapidly in size to the last as do the Cervidœ.

The last molar is markedly hypsodont, but the teeth of the series become less and less so to the most anterior one.

In conclusion, I should like to draw your attention to one or two points of comparison which should be of interest.

You will notice that the upper molars of the horse have a largely developed antero-internal cusp or protocone, connected by a ridge or neck of enamel to the anterior and inner pillar of the tooth; this was not connected in the hipparion and some others of the ancestors of the horse.

The upper molars of the ox have this protocone very distinguishable *though small*, and it does not come into use for some time after the other parts of the tooth. In the young tooth it has the form of a narrow pillar placed between the two main cusps of the tooth.

In the molars of the deer, it is seen as a small rudimentary prominence at the base of the crown, and it never comes into use.

It is entirely absent in the teeth of the sheep and goat.

It may be of some interest to you, too, to know that in all these animals, the horse, ox, sheep, goat, and deer, the first true molar is the oldest tooth in the head of the adult. It is some way advanced in development before birth, and is the only one at birth that remains through the life of the animal. For though the first pre-molar of the horse is developed synchronously with it, this tooth is generally lost early in life.

All the deciduous teeth of the horse are distinctly brachydont, the crowns being in position above the gums, which envelope the necks, and the roots being well formed during the first two or three months of the life of the foal.

Except the first, which is rudimentary, the pre-molars of the horse are larger than the molars, a unique circumstance in odontology.

NOTE.—In the compilation of these notes, which have been made *chiefly* from specimens exhibited at the lecture, frequent reference has been made to, and quotations given from, Flower's and Lydekker's "Mammals living and extinct," and Tomes' "Dental Anatomy."

THE ANTITOXIN TREATMENT OF DIPHTHERIA IN MANKIND.

EXTRAORDINARY interest is just now centred in the antitoxin treatment of the very prevalent human disease, diphtheria, because of the success attending its administration by subcutaneous injection. Though the credit of the introduction of this method of treating the disease is due to Germany, yet it should not be forgotten that it was in England that the action of antitoxins was first mooted. The late Dr. Woolridge was the first to demonstrate the action of antitoxins, and at the International Congress of Hygiene and Demography held in London in 1891, Mr. Hankin pointed out that the bactericidal action of the serum of immune animals was due to the presence of certain "defensive proteids," and that while some of these acted by killing the microbes, others acted by destroying or neutralising microbic products.

At the same meeting Dr. Kitasato, the Japanese expert who has recently discovered the bacillus of plague, stated that, in conjunction with Dr. Behring, he had shown that an injection of the blood of rabbits which had been made immune to tetanus not only rendered mice refractory to the disease, but cured the disease when it was already in progress.

In the report of the Medical Officer to the Local Government Board for 1891, Dr. Martin demonstrated the nature of these microbic products as regards diphtheria.

Mr. Ernest Hart, in alluding to the success already obtained in this country, a mortality of only 5·5 per cent. of the cases treated by it, says: "It is very desirable that caution be exercised in arriving at anything like an absolute conclusion as to its life-saving power, even in the face of this now considerable record. But it is quite evident that in a large proportion of the cases the type has been severe, and no small number of them of a gravity which seldom admits of recovery. So that we are fully entitled to conclude that where it has been used, the immunised serum has produced a marked impression on the progress of the disease, and has reduced the previously heavy mortality of diphtheria by at least one-half.

"With all this evidence before me, and in view of the fact that a sum of upwards of £8,000 has been subscribed by public donations in Paris for the supply of this antitoxin to the Paris hospitals, and towards the saving of the life of the children attacked with diphtheria; that large sums approximating to the Paris subscriptions have been subscribed in Vienna, Berlin, Marseilles, and other cities; and that foreign governments and municipalities have made official grants in further aid of this object, I should not have hesitated to take the initiative as requested, and applied for funds for which the administrative organisation of the *British Medical Journal* offers facilities, but for the fact that after consultation and conference with Sir Joseph Lister, President of the British Institute of Preventive Medicine, I am led to believe that that institute will be able to fulfil the public needs of the case without having recourse to a special subscription, and for that sole object. Sir Joseph Lister informs me that by the steps already taken at that Institute it is already capable of supplying, and is supplying, the immunised serum to no inconsiderable extent, one horse being already available for the purpose of furnishing the necessary liquid; and another horse is so far advanced that it will also shortly be available, and yet further supplies will be forthcoming at no distant dates. So successful have been the proceedings thus far, that this serum is found to be of a higher degree of efficiency than any that is available from foreign sources. Moreover, the serum obtainable from the Institute will be furnished, under circumstances which will satisfy certain important *desiderata*, not always obtainable where this fluid is obtained, through commercial sources. In the first place, it will be supplied at the bare cost of production, and not with an eye to profit. Under these circumstances, it is believed that a dose sufficient for use in any ordinary case can be furnished at a cost which shall not exceed from 6d. to 9d., whereas the material hitherto sold here from abroad has varied from 5s. to 10s. for the requisite dose. Inasmuch as one injection is usually sufficient, and rarely, if ever, two are required, the total cost of the therapeutic material for each case will not exceed 9d. or 1s. 6d., so that as a drug it will not be more expensive than the usual medicaments hitherto employed. The burden upon the hospitals, therefore, will by no means be in excess of the present cost for the treatment of such cases.

"Moreover, the serum thus obtained will be produced under conditions of accurate and careful supervision by Dr. Ruffer, the Superintendent of the Institute, and Professor MacFadyan, its pathological professor. And it will be scientifically tested, so as to ensure its efficiency and its purity in all cases. This has not always been the case, it is believed, with the material which is

commercially produced, some of which has seemed to be inefficacious. It must be remembered that in the production of an active but complex organic substance such as this, skill, conscientious control, and the observance of minute precaution are highly requisite ; while the disturbing element of commercial competition is likely to be prejudicial.

"In view of these circumstances, and of the fact that many of the foreign sources of supply are either for the moment exhausted or fully used up by local requirements, I have arrived at the conclusion that in lieu of opening any such subscriptions at present it will be desirable to direct those of my correspondents who are so deeply interested in this matter to the British Institute of Preventive Medicine for any further information, only advising them that they may have to exercise some patience, and to wait yet awhile until the supply is equal to the demand. It may be well further to add that the horses suffer no pain from the inoculation or from the extraction of the immunising serum, and that they are at the present moment fatter, sleeker, and in better condition in every way than they were at the outset."

Professor Virchow has been interviewed on the antitoxin treatment, and has given his opinion with characteristic caution. He said that he had been inclined to be sceptical as to the good results obtained in diphtheria last summer in the Kaiser and Kaiserin Friedrich Hospital, as he thought none of the cases were of the severest type. In August, however, the supply of antitoxin fell short, and since then the mortality from diphtheria in the hospital had risen remarkably, showing that the epidemic was severe in character. He summed up his opinion as follows : The serum exercises a strong protective influence for weeks, perhaps for months, say three or four months. Whether this influence be lasting can be shown only by further experience. Moreover, this alone can furnish the answer to the cardinal question, Is it a specific for diphtheria ? But much has already been gained when, for instance, it is possible in a family where three or four children are down with diphtheria to immunise even one child, and this, in all probability, can be done by the serum. Virchow added that the appeal for funds published by the hospital had already brought in 17,000 marks (£850).

Dr. Casper, who until now has held a post at the Pathological Institute of the Berlin Veterinary College, has been selected by Professor Behring for the superintendence of the antitoxin preparation in Hochst.

Messrs. Schering are obliged to suspend the sale of their (Aronson's) antitoxin for some time, as some of the animals from which the serum has until now been taken have died, and the animals at present under treatment are not yet sufficiently immunised.

In a paper contributed to the *Zeitschrift für Hygiene Infectionkrankheiten*, Ehrlich and Wassermann give an account of experiments made on certain species of goat, which seem to prove that not only the blood, but also the milk, of artificially immunised animals has an immunised power.

It should be stated that not only does the serum of animals immunised by repeated inoculations with the attenuated virus act as a curative agent, but it also has a protective power, so that those who are exposed to the infection or contagion of diphtheria can be rendered proof against it.

GLANDERS OR FARCY REGULATION.

An order by the Board of Agriculture relating to glanders or farcy is published in the *London Gazette*, for October 30th. It provides that these diseases shall come under certain specified sections of the Diseases of Animals Act, of 1894, and that horses, asses and mules shall be regarded as affected by the same sections. Persons having or having had cases of disease among their

horses are to immediately notify the police, who in turn, will inform an Inspector of the Local Authority, and this official is to proceed with all practicable speed to the place where the disease exists or is suspected to exist, and there and elsewhere put in force and discharge the powers and duties conferred upon him by the Act and by this order. Local authorities are empowered to make rules for prohibiting or for regulating the movement of animals or for marking them, and for cleansing and disinfecting utensils, mangers, &c.; and there are provisions, also, for prohibiting the exposing of diseased animals in markets, fairs, or sale-yards, or placing, or keeping them on common or unenclosed land, or in fields that are insufficiently fenced. The usual penal clauses are appended, as well as those regulating slaughter with compensation. The latter provide as follows:—"(*a*) Where the horse, ass, or mule was diseased, the compensation shall be such sum as the Local Authority think expedient, being a minimum in the case of a horse of £2, and in the case of an ass or mule of 10s.; provided that in no case shall the amount of compensation, if above the said minimum, exceed one-fourth of the value of the animal immediately before it became diseased. In every other case the compensation shall be the value of the horse, ass, or mule immediately before it was slaughtered." The Order extends to England, Scotland, and Wales, and comes into operation on the 19th inst.

AMERICAN CATTLE IN GERMANY.

THE prohibition of the importation into Germany of cattle and fresh beef from the United States, owing to the detection of Texas fever among arrivals at Hamburg, has led to a rather lively exchange of views between General Runyon, the United States Ambassador at Berlin, and Baron Marschall, the German Foreign Secretary. General Runyon characterised the order as severe, unjust, and unnecessary, and as a retaliation for the increase of the sugar duties by the States, which, he added, the President would, of course, annul. Baron Marschall, in reply, admitted the first of the three epithets, but not the others, and said that Germany could not barter the soundness of her cattle for a prospective lowering of the sugar duty. The incubation period of Texas fever, he added, is six weeks, or much longer than the time taken in transport, so that the cattle which leave America apparently in perfect health, may afterwards be attacked and spread infection. General Runyon, however, disputes this, on the ground that the contagion is carried only by insects which do not exist in Europe. He also argues that dead meat cannot convey the germs of Texas fever.

FOOT-AND-MOUTH DISEASE IN ENGLAND.

THE *London Gazette* of November 2nd contains an Order of the Board of Agriculture, declaring to be an area infected with foot-and-mouth disease "so much of the parishes of Hornchurch, Reynham, Wennington, and Aveley as lies between the London, Tilbury, and Southend Railway and the river Thames." This is owing to an outbreak of foot-and-mouth disease, by which five bullocks and two heifers were affected. It is stated that the animals had been on the Essex marshes for nearly two months, and had not been in contact with any other cattle. They were slaughtered, as well as other cattle in the locality.

The *London Gazette* of the same date also contains an Order of the Board of Agriculture stating that an Order prohibiting the movement of cattle, sheep, goats, and swine into or out of or within a district comprising

the petty sessional divisions of Beacontree, Brentwood, and Orsett, and the liberty of Havering-atte-Bower, in the county of Essex, shall not apply to the movement of animals landed as foreign animals at the landing-place for foreign animals at Thames Haven, in the port of London, provided that such animals are moved by railway from the said landing-place, and are not untrucked within the said district.

The disease has appeared in Kent, Essex, and Cambridgeshire, and its origin cannot be traced.

TRANSMISSION OF HUMAN CANCER TO ANIMALS.

In a communication to the Société de Biologie, Boinet (*Sem. Méd.*, June 13th, 1894) presented a report of researches made by him on this subject. He made, with the necessary antiseptic precautions, 60 inoculations on animals (rats, guinea-pigs, rabbits) of various malignant tumours (scirrhus, encephaloid of breast, epithelioma of lip, umbilicus, penis, and uterus, lympho-sarcoma of testicle). The results were as follows: In a series of 40 intraperitoneal inoculations, made chiefly in rats, generalisation of the cancer took place only in one case. A month after the intraperitoneal inclusion of a fragment of cancer of the penis from a man, a large rat was seized with complete paraplegia and marked diminution of sensibility. Eight days later the animal died, and on *post-mortem* examination two fragments of the tumour which had been inoculated were found in the peritoneum, and some small nodules on the surface of the liver. Moreover, two cancerous masses as large as cherrystones had developed above the tendinous centre of the diaphragm; they were adherent to the bodies of the dorsal vertebræ, which were secondarily invaded to such an extent as to produce marked deformity of the spinal column. Compression of the cord with consecutive paraplegia had been the result. Histological examination showed that these secondary nodules contained cancerous cells similar to those in the growth which had been inoculated. In a series of 15 subcutaneous inoculations, the results were uniformly negative, the inoculated fragments being absorbed. Subcutaneous injection (in a rabbit) of the juice of the lymphosarcoma of the testicle, however, caused the development of a cancerous nodule as large as a haricot bean at the point of inoculation. Injection of the same material into the pleura of an old rat caused the formation of a large cancerous nodule in the corresponding part of the lung. From these facts Boinet draws the conclusion that human cancer is transmissible to animals. The inoculations are best made into the deep parts of the peritoneal cavity, under the liver or in the neighbourhood of the tendinous centre of the diaphragm. In none of Boinet's experiments did a positive result follow inoculations made into the thickness of glands (breast, testis) or into mucous membranes near to the natural orifices. Cancer of the breast of a bitch was inoculated without effect in the peritoneum and subcutaneous cellular tissue of rats, rabbits, and guinea-pigs.—*British Medical Journal.*

ANIMAL DISEASES IN BRITISH CENTRAL AFRICA.

In a Blue Book recently published, containing the Report by Mr. H. H. Johnston, Her Majesty's Commissioner and Consul-General, on the first three years' administration of the eastern portion of British Central Africa, among many very interesting notices of that country allusion is made to its agricultural features and prospects. In estimating the value of the region for stock-rearing, he says that the greatest curse which nature has laid on this and other parts of South Central Africa is the existence of the tsetse fly.

"Were it not for this the value of the country would be centupled." At present it is only over small and widely-separated patches that horses and cattle can be kept free from the attacks of the fly. This pest is scarcely ever found above 3,000 feet, and an orographical map shows those parts of the region from which the fly is absent.

Cattle have also been subject to a lung disease which began in the country South of Abyssinia in 1893, and gradually crept southward, developing a peculiar virulence till it reached the northern end of Lake Nyasa. It now seems to have died out. This disorder not only killed domestic cattle, but it destroyed myriads of buffaloes, antelopes and zebras, and even in some parts cleared off the big game.

Speaking of the devastation and ruin brought about by the Arab slave-dealers, he says: "The depopulation caused by the frequent ravages of the black Portuguese and the Arabs or the Arabs' negro allies reduced considerable tracts of country to a state of wilderness, and this wilderness becoming once more occupied by big game, the tsetse fly increased and multiplied, and now renders considerable portions of Central Africa difficult of colonisation on account of the impossibility of introducing horses and cattle, until by the slow process of repeopling the tsetse fly has been got rid of."

MEAT INSPECTION IN COPENHAGEN.

THE point that is, perhaps, most interesting in the sanitary administration of Copenhagen, is the meat inspection, and certainly it is one about which we have almost everything yet to learn in this country. Meat inspection cannot be properly carried out except where there is a general abattoir, and only in the best manner possible when the abattoir is associated with the cattle market. These two, abattoir and cattle market, adjoin one another in Copenhagen. Slaughter of animals can take place nowhere else in the city, and here, too, it must be examined by specially-trained veterinary surgeons. Carcases of animals, especially of pigs already slaughtered, may be brought from the country, but before they can come on the open market, they must receive the official stamp of the inspector. The abattoir is situated close to the railway and harbour, and covers an area of five acres. Though opened in 1883, five years were allowed to elapse before the control was introduced. The market is partly covered and partly in the open. The ground everywhere is paved with granite blocks set in cement. The rooms in which the slaughtering is done vary considerably in size. Some—those first built—are on the cell system; that is, small separate rooms with accommodation for about six oxen; while the more recently built ones are large spacious halls that permit of as many as 120 animals being slaughtered at the same time. They are lofty and well lighted, the tiled or granite floor slopes to a central channel, the walls are of cement, and the pillars and beams used for suspending the carcases, are of iron. A plentiful supply of water (an absolute necessity in a well-managed abattoir), is everywhere present. In none of the buildings could any unpleasant smell be detected. Before being slaughtered, the oxen are first stunned with a poleaxe. One must, however, in this matter give the preference to the method of fixing a mask, with a nail in the centre of it, over the head. After slaughter, all the organs must be retained until the veterinary surgeon has made his rounds. The animals are first inspected by a veterinary surgeon as they stand in the market, and any animal detected with contagious disease, is marched off to a quarantine stall, and slaughtered in a special room.

The inspection of the carcases differs slightly from that in vogue in Paris,

Brussels, and Berlin, but will serve very well as an example of how this characteristic feature in continental hygiene is carried out. The veterinary surgeon, accompanied by the meat marker, first cuts into the glands of the neck; examines the pleura and peritoneum, to see if there are any signs of inflammation, and if he finds nothing amiss, does not examine the glands further. The meat is then stamped, in the case of large animals, in twelve different places. Should the glands in the neck, however, be found to be enlarged or suppurating, he undertakes a thorough examination of the submaxillary, axillary, bronchial, mesenteric, inguinal, and lumbar glands, rapidly cutting into them to see their condition. The muscles at the base of the tongue are always cut into to see if cysticerci are present. The lungs, liver, kidneys, and spleen are carefully handled and incised. Tubercle when generalised is a sufficient cause for seizure, but not when localised in one or two places. In the latter case, the diseased portions only are removed. When in doubt as to the dissemination of tubercle, the vertebræ are sometimes sawn through the middle, and if found to be affected with it, the carcase is condemned. A less minute examination is made of calves and sheep. Here the pleural and peritoneal cavities are inspected, and the lungs (not removed from the body), are incised *in situ*. The inspection is more careful when the animal has been slaughtered outside Copenhagen, and as the organs have been removed, it is attended with greater difficulties. It can, of course, only be done with any degree of satisfaction after much practice and experience. Meat that is satisfactory is marked in blue. A black stamp, used liberally in the case of imported meat, is employed to mark carcases which, although not condemned absolutely, have had some exception taken to them. Such meat is regarded as of second-class quality, and is sold at a proportionate reduction.

The staff consists of a superintendent and twelve assistant veterinary surgeons. A private company converts the blood, by admixture with peat and sulphuric acid and drying in ovens, into a very valuable manure. The condemned meat is conveyed to a destructor, where, after the fat has been separated, it is destroyed. No bone-boiling or gut-scraping is done at the abattoir. Some of the sausage manufactories in the neighbourhood are visited regularly, and the meat inspected by veterinary surgeons.—*The Lancet.*

THE SCOTTISH CHAMBER OF AGRICULTURE AND TUBERCULOSIS.

At the meeting of this important agricultural body held on November 13th, Professor Williams moved a resolution remitting to the directors to take what steps they thought proper to urge the Tuberculosis Commission to issue their report without further delay. The professor stated that in Edinburgh 25 per cent. of the cattle were said to be affected with tuberculosis, and in his experience the percentage was still higher. The tendency to tuberculosis was certainly hereditary, and was transmissible, though seldom, by the cow to the horse. The land grazed by such cattle became infected, and this accounted for the fact that nowadays tuberculosis was found in rabbits. In the human being the danger of infection was very much greater from the milk than from the flesh of diseased cows. He should be sorry to see the sale of the meat of the "piner," which was soft, flabby, and dropsical, legalised in this country as it was in Germany. But the idea nowadays was that if there was any tubercle it must be unclean. His idea was that where the tubercle was local, the poison which was generated by the bacillus was localised, and the flesh of many splendid animals was perfectly good for

food. It was a great hardship that a butcher should not be compensated for the loss of an animal which in its appearance showed no signs of tubercle. He strongly urged the extension of inoculation by Koch's method, and full compensation of those who at present were made to suffer in the public interest.

Mr. A. HUTCHESON seconded, and Mr. ALEX. POTTIE, Paisley, supported.

Mr. SCOTT DUDGEON suggested, as an addition to the motion, that the Government should be urged to grant compensation and to provide for the inspection of imported cattle.

The motion, with this addition, was approved.

Obituary.

THE following deaths have been reported :—

McLaren Kitching, M.R.C.V.S., Cupar, Fife,	graduated	1832.
J. Dickie, M.R.C.V.S., Ayr	,,	1887.
K. E. Burton, M.R.C.V,S., Edinburgh	,,	1893.
M. Fitzgibbon, M.R.C.V.S., Rathkeale, Ireland	,,	1892.
C. Martin, M.R.C.V.S., Chesterfield	,,	1881.

Reviews.

HEAVY HORSES: THEIR BREEDS AND MANAGEMENT. By H. BIDDELL, C. I. DOUGLAS, T. DYKES, DR. G. FLEMING, C.B., F.R.C.V.S., A. MACNEILAGE, G. MURRAY, W. R. TROTTER. (London: Vinton & Co., 1894.)

This is the third of the series of Live Stock Handbooks which the enterprising firm of Vinton & Co. has undertaken to bring out, and it is as well worthy of commendation and acceptance as its predecessors, which is saying a great deal for it. The seven chapters of which the book is made up deal in succession with the history and characteristics of the Shire horse, the Suffolk horse, and the Clydesdal horse, the breeding of heavy cart-horses for street work, the London work-horse in street and stable, the farm management of heavy horses, and the diseases and injuries to which heavy horses are liable. The history of the three principal breeds of heavy horses—animals which form so large a portion of our equine wealth, and are of so much value to the entire community—is dealt with in an interesting and satisfactory manner, and typical horses are well described, as well as pictorially delineated in no fewer than twenty-nine full-page illustrations. Veterinary surgeons must feel interested in all the chapters, but those which will more particularly deserve their attention are on the breeding of heavy cart-horses, the London work-horse, and the farm management of heavy horses. Breeders should find the book of exceeding value, as over and over again the defects and oversights only too frequently occurring in breeding this class of animal are pointed out and insisted upon, and what should be done to ensure the production of sound first-class horses is clearly indicated. No greater service could be bestowed than that of putting breeders upon the right way to produce those horses which are of most value, those which possess all the best qualities of the heavy draught horse, such as are in greatest demand for the traffic of our large cities, for such animals are by no means easily procurable. "Were I," said the manager of one of the largest yards

in London, "to advertise in the midland counties for a score of such horses, the chances are that when they were sent up on approval, I should have to consider myself lucky if I got hold of one good working pair. The others would have to be rejected as too light."

Such a book as this is of benefit to the nation, as not only does it point out faults in breeding, rearing, and managing the most useful of all breeds of horses, but it shows how these faults and failings may be abolished; in this way its value is far beyond its selling price—only three shillings and sixpence—and it certainly should be in the possession of everyone who has to do, directly or indirectly, with these mammoth horses. In every way the task of the editor of the series, whether in the way of arrangement of the matter or the get-up of these books, is most satisfactorily carried out, and certainly merits hearty recognition.

SMITH'S PHYSICIANS' AND SURGEONS' VISITING LIST. (London: Hazell, Watson, and Viney. 1894.)

An attempt was made for two or three years to supply veterinary surgeons with a pocket-book containing a diary, almanack, visiting list, and a mass of technical information for every-day reference during the year; but the venture proved unsuccessful, and for some time there has been no annual of this description available. The printers of this journal have issued a Visiting List for medical men, for the year 1894, which can be made available by veterinary surgeons, by omitting certain portions which have reference to mankind only, and inserting some plain ruled sheets on which to enter special details. Such books greatly facilitate the performance of a practitioner's daily work, and it is difficult to understand how it can be carried out with regularity and exactness unless such means is at hand for entries and reference. The fact that this well-finished pocket companion is now in its forty-ninth year is evidence as to its usefulness.

CALZATURA PRESERVATIVA E CURATIVA PER LE MALATTIE DEI PIEDI DI TUTTI GLI ANIMALI DOMESTICI. (PRESERVATIVE AND CURATIVE BOOTS FOR DISEASES OF THE FEET OF ALL THE DOMESTIC ANIMALS.) By DR. FREDERICO BOSCHETTI. (Milan: Tipografia degli Operai. 1894.)

In a little pamphlet, the talented author of several important veterinary works—Dr. Boschetti, formerly of the Turin Veterinary School, and now promoted to the chair of pathology and clinical veterinary medicine in the University of Parma—deals with the subject of boots, or, more correctly, boots and stockings, for animals suffering from accidental diseases, or those of a contagious or infectious character. The garniture consists chiefly of a leather boot, to the upper part of which is attached, all round, a stocking of soft leather, or other strong and pliable material, that is fastened around the foot and leg by means of straps, so disposed that the whole can be opened without removal from the limb. By this arrangement dressings can be readily applied to any part, and maintained securely, while cleanliness is ensured. The apparatus will save time and worry in many of the numerous cases in which difficulty is experienced in treating diseased feet, pasterns, and fetlocks.

Army Veterinary Department.

THE *Gazette of India* of October 20th announces that Veterinary-Captain Joseph A. Nunn, D.S.O. Army Veterinary Department, has been appointed Veterinary-Surgeon to the Punjab Light Horse (Volunteer Corps).

Proceedings of Veterinary Medical Societies, etc.

THE CENTRAL VETERINARY MEDICAL SOCIETY.

THE annual general meeting of this society was held on October 4th at the Royal College of Veterinary Surgeons. Mr. A. Prudames, the president, occupied the chair, and there were present:—C. E. Edmonds, Esq., Vet.-Capt. E. R. C. Butler, A.V.D.; Professor F. Hobday, Messrs. H. Edgar, F. W. Kendall, G. C. Lowe. F. C. Mahon (hon. sec.), Professor T. Macqueen, J. H. Manton, J. E. Rickards, J. Rowe (hon. treas.), H. G. Rogers, S. H. Slocock, S. Villar, F. Orford, L. Walpole.

The SECRETARY read the annual report, which showed that during 1893-4, 23 fellows have joined the society, and four resigned. At the present time the society numbers 125. There have been five council meetings and eight general meetings held during the session, the average attendance being 27.

The receipts during the session have been £124 7s., to which a sum of £15 10s. 7d. is added from the preceding year, making a total of £139 17s. 7d., the expenditure being £77 9s., leaving a balance in hand of £62 8s. 7d.

The funds on deposit and in the hands of the hon. treasurer amounted to £150.

The following gentlemen were elected fellows:—Mr. C. Squair, Reigate; Mr. Tooth, Enfield; and Mr. James Buxton, Highgate, N.

Mr. S. Villar was elected president for the ensuing year, and Messrs. Prudames, Wragg, Butters, and Slocock, vice-presidents; while Messrs. Rowe, as treasurer, and McMahon, as secretary, were re-elected.

The members of council elected were:—Professor Penberthy, Mr. J. A. W. Dollar, Professor Macqueen, Mr. Rodgers, Mr. Hunting, Mr. Edgar, Mr. Hurndall, Mr. Roots, Capt. Butler, Professor McFadyean, Professor Penberthy, and Mr. Sheather.

The Jubilee Memorial.

The CHAIRMAN announced that Professor Macqueen had given notice of his intention to move, at the next meeting of the society, a resolution with reference to the proposed memorial to the petitioners for the original charter of the Royal College of Veterinary Surgeons.

The Retiring President.

The CHAIRMAN: Having concluded the business of the evening, and in view of soon closing my year of office, I desire to avail myself of this opportunity of thanking you one and all, present and absent, for the kind way in which you have treated my incapacity to carry out the duties I could have wished to perform. I have to thank you for the able support you have given me; for the kind attention with which you have listened to my poor efforts at different times; for the readiness with which able papers have been brought forward, and the manner in which they have been discussed, to the credit and advantage of this society during the past year. I sincerely hope that the society may in the future continue on its prosperous and useful course. I trust I may have the opportunity of continuing to attend the meetings of the society in order to still further benefit myself by obtaining, as I have done in the past, knowledge on different important points connected with our profession. I do hold that these meetings are of very great value, and that no matter what one's attainments may be, every member of the society must derive advantage from the papers he hears read and discussed. I have learnt much from the meetings of this organisation, and I have to thank many of you for what you have taught me, and especially for the kind consideration you have shown me during my presidential year. I have now to propose a vote of thanks to the scrutineers.

Mr. EDGAR: Mr. President, I think that this ought to be the occasion on which, before we thank the scrutineers, we should accord a very hearty vote of thanks to our retiring president. I cannot let this opportunity pass without expressing to you my own and, I believe, the thanks of all who have attended these meetings during the past year, for the way in which you have presided over them. You have done so with the utmost fairness and the greatest consideration in every respect. Perhaps occasionally it may have been thought that you were a little too lenient, but at the same time you have known when to pull us up and keep us in order. I must say that it is not, probably, all honey in occupying the chair at many of our meetings. I am sure the members present, however, will agree with me when I say that we have had very pleasant meetings during the past year. The president is really our man of light and leading, and to him we owe our thanks. I have to propose a very hearty vote of thanks to Mr. Prudames for his conduct in the chair during the past year.

This having been seconded and carried *nem. con.*,

The CHAIRMAN returned thanks.

Thanks having been accorded to the scrutineers, the proceedings terminated.

An ordinary general meeting of this Society was held in the Masonic Temple (Holborn Restaurant) at 6 p.m. Thursday, November 1st, 1894. The President, Mr. S. Villar, occupied the chair, and there were present as guests of the Society, Dr. Ruffer (British Institute of Preventive Medicine), Professor Bayne and W. Hunting, with Messrs. Lepper, St. John Smith, and Weatherley (guests of the President); also the following gentlemen, viz., Professors M'Fadyean, Macqueen, Penberthy, Axe, Hobday, and Shave, A. Broad, J. K. Bruce, Vet.-Capt. E. R. C. Butler, A.V.D.; M. Clark, J. A. W. Dollar, C. J. Humphreys, Veterinary-Major Longhurst, F. C. Mahon (Hon. Sec.), A. Prudames, W. Roots, A. Rogers, J. Rowe (Hon. Treas.); J. E. Rickards, S. Slocock, C. Sheather, F. Sampson, F. Wragg, J. Woodger, and as visitors Dr. Nutt, St. Paul's Churchyard; and N. Almond, Esq. of Chelmsford.

CORRESPONDENCE.

The HON. SEC. read letters and telegrams regretting inability to attend the meeting, etc., from Messrs. T. B. Goodhall, Christchurch; J. Roalfe Cox, T. Auger, Wymondham; Geo. C. Lowe, and C. Lowe, Dockhead; J. Malcolm, Birmingham; H. Olver, Tamworth; Prof. T. Walley, Edinburgh; J. P. Walker, Oxford; W. Stapley, Dartford; H. Edgar, Upper Clapton; J. S. Hurndall, Major Matthews, A.V.D.; Major Glover, A.V.D.; S. Buxton, J. W. Barker, W. J. Mulvey, W. F. Barrett, H. W. Caton, H. D. Gibbings, H. M. Singleton, F. Elworthy, Major J. C. O. Fowler. A.V.D.; and Veterinary-Captain Smith, A.V.D.

Mr. SIDNEY VILLAR, F.R.C.V.S., delivered the following presidential address:—

GENTLEMEN,—Permit me at this, the earliest opportunity, to thank you for the great honour you have conferred on me by electing me President of this Society. To fill such a position in this the largest and most powerful of our societies, one which numbers amongst its fellows most of the leading members of our profession, is indeed a great honour. Although appreciating keenly your kindly feeling in promoting me to such a position, I have had considerable diffidence in accepting it, being well aware that my capabilities are hardly sufficient to cope with the responsibilities of the post. This diffidence is considerably lessened by the feeling that I have many good friends in this society who will give me the benefiit of their help and advice should occasion for such arise.

It is, perhaps, customary in an inaugural address to allude to the current

politics of our profession; this evening I propose to deviate somewhat from the beaten track, to ignore politics, but to treat of the condition of our profession as it presents itself to a somewhat young practitioner who has, in every sense of the word, to work for his living. I am constrained to do this because I feel that young practitioners of the present day are beset by difficulties which perhaps did not obtain with the veterinary surgeon of only one decade ago. It is true that our social position as members of the community is now higher than it has ever previously been, but I cannot but come to the conclusion that to derive only a modest income from the practice of our profession is more difficult than it has ever been before, and necessitates harder work and more constant application than is required in many other callings of life. The causes conducing to this struggle for existence, for such it undoubtedly is with some of us, are to be found both within and without our profession, and, I take it, are due to a combination, the chief factor of which is undoubtedly the present distressed state of agriculture in this country. The bad condition of the agricultural interest affects all classes of the community, but none more than it does the veterinary profession. With wheat at less than a quarter of its value of 25 years ago, and fat stock of all kinds much reduced in value; with the produce of foreign countries carried for thousands of miles at less rates than our own produce is taken for tens, what wonder that the poor farmer is unable to pay his bills or his rent. He cannot, in many cases, purchase live stock for want of funds, and should he have sickness in his horses or cattle he must perforce get medicine and advice in the cheapest market, he *must* employ a veterinary surgeon to operate on his colts, or to help his cows or mares when in trouble, but for ordinary cases why need he incur such expense? Does not his own local newspaper offer him advice gratis, or if he writes the particulars of his scouring-calves or parasite-infested foals to a London weekly will they not give him a *recipé* for medicine which will cure them, and which he can either mix himself or get prepared for a trifling sum by a druggist, or at the nearest co-operative stores? And who *can* blame the poor farmer, or for that matter the poor landlord either, who being unable to get his rents must reduce his establishment and decrease his stud, but who has facilities for economising in one direction by studying the articles and prescriptions of lay journals as to the ailments of live stock. This distressful condition of agriculture is recognised by others than newspaper proprietors. In many cases county councils who hold cooking, home nursing and dressmaking classes, have seen that benefit and saving may accrue to the ratepayer by holding classes in veterinary medicine and surgery which classes are open to all and sundry, and must necessarily injuriously affect the veterinary profession. Then, again, it is recognised by lay manufacturers of veterinary medicines, who issue their pamphlets and low-priced medicines, and even William Whiteley, the "Universal Provider," advertises his cough balls and fever powders for cattle at so much per dozen.

Besides the depression in agriculture, other influences for evil are to be found. The appointment by the Board of Agriculture of amateur veterinary surgeons under the title of travelling inspectors has in some cases, as indeed it has in my own, materially affected the income of the veterinary surgeon. The manufacture of Farriers or Registered Shoeing Smiths has undoubtedly increased our difficulties. "Registered Farrier and Shoeing Smith," so my neighbour, a blacksmith, advertises himself to a community in which most persons regard farrier and veterinary surgeon as synonymons. Now these and other minor circumstances combine to make the life of the country veterinary practitioner a particularly hard one. Only the most severe cases and operations fall to his share—the rough side of veterinary surgery, the ordinary case, the smooth side of practice, is treated without his assistance; not only so, but the calls for his skill are much decreased and his income

suffers in the same degree. What wonder, then, that the veterinary surgeon rushes to the populous cities, the fashionable watering places, and the sporting centres, and there by overcrowding produces that over-competition and low rate of fee with which we are all more or less acquainted, and which all of us deplore.

It has been said by some that the profession itself is overcrowded. I do not for a moment agree with this. The more really good practitioners that we have the better; the more good men, the more powerful brains we have at work the better will it be for our reputation as a profession, the more will our existence be felt; and I take it that instead of being disheartened by the present bad condition of things we ought to be stimulated to do more to attain to higher standards of excellence, to advance, if possible, a bit in front of the times; and by so doing show the general public that our individual knowledge and skill is of the best, and that whether it is necessary to treat a sick animal suffering from a trivial ailment, or to stamp out an epidemic at enormous national cost, it is far more economical in the long run to employ skilled veterinary aid—be quack medicines never so cheap, or political or personal influences never so pressing.

Gentlemen, I have suggested that the condition of things, agricultural generally, is at present so bad as to offer but little inducement for young practitioners to embark in purely country practices; but there is one department of agriculture which is prosperous, one great industry which is in a thriving condition, one which must always exist—I allude to dairy farming, the keeping of milch cows. Fat cattle and store beasts were perhaps never cheaper than they are at the present day; milch cows have probably never been so scarce or expensive as they now are. Our population increases, the demand for milk increases, and with it the number of cows and the requirements for its proper and hygienic production. To this dapartment of agriculture I venture to call the attention of some of our younger practitioners, feeling sure that the study of cattle pathology, or more correctly speaking the treatment of sick cows, is not only deserving of greater attention than it now receives, but that it affords, and will continue to afford, a source of considerable income to such of our members as will devote their attention to it. The accumulation of dairy herds iu the suburbs of large towns and in particular localities known as being favourable for this class of agriculture renders the study of cattle pathology as a speciality more remunerative than would otherwise be the case.

An idea seems to prevail that the exhibition of cathartics and aromatics practically covers the whole ground of cattle treatment; this is very far from being the case, more especially in dairy herds. Cows are artificially bred, artificially fed, and kept under circumstances altogether removed from their natural condition to make them producers of extraordinary quantities of milk. Such treatment produces milk, but it also produces disease, and so work for the practitioner. It has been said that cattle "show no symptoms." That they are lethargic and do not readily indicate their troubles is undoubtedly true, it is oftentimes difficult to observe the symptoms they show, or to recognise the cause giving rise to such symptoms; but is not this all the more reason why we should devote our energies and skill to diagnose and successfully treat the pathological conditions which are hidden to the ordinary observer? So, gentlemen, as one remedy for the present condition of things veterinary, I venture to advocate the more extended study of cattle pathology. But we are not all of us inclined for this class of work nor, indeed, adapted for it; this division of our calling can at best occupy but a small proportion of our number. The same can be said of dog practice, although this latter department of veterinary medicine has increased wonderfully of late years, now makes a considerable item in the ledgers of most metropolitan and suburban practitioners, and affords handsome incomes to some gentlemen who

make a speciality of canine surgery; yet it is still usually insignificant in provincial places.

The question has frequently been raised—Is it advisable to combine any business with the practice of our profession?

With one exception I think it is not expedient to do this, although I take it that if it seems good to a man to do so, he is justified in so doing. The tendency of the age is to combine, and, moreover, we have examples of combined callings in other equally respectable positions of life—the parson adds to his stipend by taking pupils; the practitioner of human medicine often is the proprietor of a druggist's shop, or receives patients into his household for treatment; and the country gentleman also seems now to add to his income by the entertainment of paying guests—therefore, if a veterinary surgeon feels he has a special power or urgent necessity to practice another calling, I do not think that we ought to look down upon him and his work, provided such calling is honest and respectable. Bearing in mind that in town practices a very large percentage of lameness is due to some pathological condition of the foot, that the adaption of particular shoes is absolutely essential to the treatment and cure of many cases of lameness, I think the proprietorship of a forge is often not only permissible, but an actual necessity. This does not, however, apply in an equal degree in country places, and this, I take it, is the only business which we can expediently combine with the practice of our art.

Let us devote, instead, our spare time and energies to the study of our noble profession, and we shall undoubtedly enjoy the confidence of the public, and flourish, despite the unwarrantable competition which we now have to withstand from many outside, and from a few within, our own beloved profession.

Professor MACQUEEN alluded warmly to the President's able address, remarking that he was sorry not to have been present at the commencement of its reading. He strongly agreed with the chief points touched upon, and begged, in conclusion, to tender a hearty vote of thanks to Mr. Villar.

This was seconded by Mr. J. A. W. DOLLAR, and carried *nem. con.*

The gentlemen before mentioned then adjourned to the Queen's Salon for dinner. During the evening various toasts were honoured, and Messrs. Wright, Stuart, Walker, W. J. Noel, Professor Bayne, W. J. Woodger, and F. O. L. Walpole delighted the company with some able songs, and served to render the evening a pleasant one.

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of this Association was held at the Red Lion Hotel, Basingstoke, on September 27th, the President, T. B. Goodall, Esq., in the chair.

The HON. SEC. (Mr. C. Pack) said letters had been received regretting inability to attend from Professor Pritchard, Mr. Drewitt, of Bournemouth, Professor Penberthy, and Mr. Blake; also telegrams from Mr. Barlow, of Reading, Mr. Carter and Mr. Wragg.

Exhibition of Morbid Specimens.

The PRESIDENT said he had a specimen of renal calculus, which was interesting from the fact that it caused no illness during lifetime. It was an old forest mare, and the story given him by an old forester was, that she was very thirsty, that she was drinking from a very shallow brook, and that she must have swallowed a stone. She was taken with violent colic after drinking. The calculus was found after death in the kidney, and the idea of the forester was that she must have taken it out of the brook.

Election of New Members.

Mr. Dawtrey and Mr. Blake were unanimously elected members.

Mr. G. Parr, of Salisbury, Mr. A. Wheatley, of Reading, and Mr. Jarrett, of Basingstoke, were nominated for election.

Professor F. SMITH gave an address on—

"INTESTINAL OBSTRUCTION IN THE HORSE."

Mr. President and Gentlemen,—In selecting intestinal obstruction as the subject for your discussion this afternoon, I have been guided by the fact that first of all it is one of extreme interest to us, and secondly, that we know, I think, comparatively little about it. No matter what experience we may have in connection with bowel diseases, it is quite certain that there are no two causes the same. It is equally certain that we are much wiser as to those cases after death than during life. In other words, that it is our *post-mortem* examinations which must throw light upon the conditions existing during life rather than our power of diagnosis. For these reasons I bring this subject forward for your discussion.

We may define intestinal obstruction as anything which prevents the passage of fæces through the body, accompanied in the majority of cases by abdominal pain. There are a variety of causes which will lead to this condition, but those which I purpose dealing with are principally twists or displacements of the bowel, strangulation of the bowel, and the blocking up of the intestinal canal by means of sand, gravel, or any other substance. Further, I think we may, from clinical experience, rightly separate these cases into those which give rise to acute symptoms, where life terminates very shortly after the attack commences, and those giving rise to sub-acute symptoms, where life is prolonged for a few days, and, perhaps, even recovery follows.

The acute form of intestinal obstruction is undoubtedly twist and strangulation, and in considering twist and strangulation, we have to divide them into, first of all, those which affect the small intestine, and those which affect the large intestine. It was only a very few years ago that the fact of the displacement of the horse's colon was made known to us, and I believe the very first person in this country who ever drew attention to the fact that the double colon is perfectly capable of turning a somersault in the horse's inside, was Professor Walley. Twist in the small intestines was long before recognised, but no one seemed to have discovered that the colon was capable of turning upside down in the horse's interior until Professor Walley drew attention to it.

Speaking in the first instance of twist in the small intestine, we find that probably the bowel more affected than any other is the ileum, and the next in frequency is that portion of the small intestine which is nearest to the duodenum. There must be some very good reason why the ileum is more liable to twist than any other portion of the small intestine, and, although I am not prepared to offer any explanation, I would draw attention to this fact, that the ileum is thicker and more muscular than any part of the small intestine, and is invariably found contracted after death. Moreover, as the result of observation in vivisection, it is always contracted during life. The function of the ileum is not only to supply a certain amount of fluid for the purposes of digestion, but it also regulates the rate at which the material is to pass from the small to the large intestine. It is practically a sphincter, not one limited to a very small area, quite close to the cæcum, but a sphincter of considerable length. Quite a foot or two of the ileum is of this extraordinary thickness, and though I am not prepared to explain why iliac twist is so common, yet I think there must be a something in connection with its function either regulating the rate at which the material is passed into the large intestine, or in connection with its thickness and extreme muscular power, to account for its twisting more frequently than any other part.

The bowel is not necessarily twisted on itself, although it may be. It is quite possible we may get twist by a loop of bowel passing into a rent in the mesentery. In fact, I have had a twist which was due to the loop of bowel passing into the peritoneum, which held the double colon together. Further, I have known a small intestine find its way into a hole in the abdominal cavity formed by the piece of peritoneum known by the name of the foramen of Winslow, which consists of two layers of peritoneum coming together just above the stomach. Where they come together there is a hole, and through this small hole, in some extraordinary manner, a piece of intestine has found its way on more than one occasion in my own practice. We may also have a small intestine finding its way into rents in the diaphragm, the rent itself being very small. It is curious why the diaphragm should occasionally be rent to such a limited extent. I can understand its splitting from top to bottom, but I do not understand the small rents which are occasionally met with where the loop of bowel passes in and eventually becomes strangulated. In addition to that, though it is not commonly met with, the small intestine may find its way into the inguinal canal, giving rise to inguinal hernia. It is almost impossible to define between these forms of twist or strangulation of the bowel, but they all undoubtedly give rise to acute abdominal pain, and the question we are called upon to settle in seeing a case of this description is, what is this horse suffering from? The most prominent feature is pain; but does this arise simply from a form of colic, recognising a colic as a simple spasm of the bowel, or extreme distention of the bowel; or is it pain following on a loop of bowel having gone through some of these holes, or its having become twisted on its own axis? I regret that I am perfectly unable to determine, when called to one of these cases, whether it is going to terminate fatally or to recover. Later on, when we find that the pulse is altering in character, the pains are becoming continuous, and the animal bears that peculiar expression in the face which portends a fatal issue, we may say he is going to die, but I do not think any of us can say what is wrong with him.

It is necessary that we should endeavour, as far as possible, to analyse the symptoms that a case of this sort presents. Take, for instance, the character of the pain the horse is suffering. There can be no doubt that all cases of abdominal disease which are attended by continuous pain are serious. On the other hand, it does not at all follow that because there is at times a certain amount of relief from abdominal pain that the case is a simple one. Speaking broadly, we may say continuous pain is an extremely grave symptom, for the reason that in by far the majority of cases it points to something having gone wrong in the small intestine, which is practically past all ordinary medical relief. I endeavour to inquire not only as to the length of time the animal has been in pain, but also the character of the pain, and especially whether at any time the animal has shown any relief from pain. By making such careful inquiries into the cause of pain, we may occasionally glean some valuable information—not, perhaps, so much in private practice, where one has to depend chiefly upon untrained observers, as in the case of animals in the hands of men who are trained to observe. I am speaking of my own case, where the men take notice of these things, and where we get earlier information, perhaps, in the majority of cases than falls to your share. I have often had a considerable amount of assistance given me in such cases from learning the character of the pain, and something more about it than, perhaps, would fall within the experience of the private practitioner.

There is another thing in these cases, viz., the time of day. It seems a very peculiar thing to say that the time of day can in any way influence the nature of the disorder which is present in the intestinal canal, and I put this forward with a certain amount of diffidence; but my experience is this, that more fatal cases come to me early in the day than towards the evening. There

is no doubt whatever that the majority of cases of colic come towards the evening, and, as a rule, you will find that such cases will yield to treatment; but I am always suspicious of cases that come to me about noon, and especially of those which come early in the morning, say before eight o'clock. I shall be glad to hear your experience on this point, as to whether or not I am right in saying that in all probability those cases which terminate fatally occur earlier in the day, whereas those which are going, in all probability, to recover, and which come under the head of ordinary colic, occur in the late afternoon or in the early evening. It may be that the whole thing will depend on the system of watering and feeding adopted at various establishments where these cases may occur, but whether that is so or not I cannot at present determine.

Do we learn anything by watching the character of the breathing? Sometimes I have thought we do. I think I have observed in cases where the bowel has become twisted—speaking solely of the small intestine—that the breathing is short. The horse does not seem to breathe with the abdominal muscles, but prefers to do all the work with the chest: the ribs are moving, the diaphragm is doing the work without receiving much assistance from the abdominal muscles. In other words, the abdominal breathing is short and shallow.

Then about the character of the pulse. Some time ago, in conversation on this subject, I was told by a practitioner that he did not believe a bit in the pulse, and he very rarely took it. I hope I did not misunderstand him, but the impression left was that he did not consider the pulse of the slightest value in these cases. I consider it of the very greatest value; so much so, that I believe we can ascertain from the character of the pulse alone as to how such a case is progressing. I am not going to say it tells me whether there is bowel in the diaphragm, or a piece is twisted on itself, or there is a rent in the mesentery, but it will tell me whether the horse is holding its own, or, on the other hand, whether a grave lesion exists which is likely to terminate fatally. In such a case the pulse is best described by saying that it is oppressed. In the same way as we have the oppressed pulse of pneumonia, so we have an oppressed pulse in some of these forms of abdominal disease. Apart from the fact that the pulse becomes very much quicker, it may be largely due to pain. There is also the fact that the pulse has lost volume, and when I have found in a horse with abdominal pain a small, quick pulse, I look upon it as an extremely serious condition. The only point I make is that we may find from the pulse how a case is progressing.

We may or may not have a certain amount of tympany of the bowels. As a rule, when the small intestine is twisted we have a certain amount of tympany in the bowel, though not so much as when the large intestine is strangulated. We may have coils of the small intestine considerably distended with gas, which give no evidence externally. Looking at the horse's belly, you could not judge from appearance whether there were any coils, but those coils may be felt by rectal examination. Many years ago I read a paper published by a very thoughtful observer, who stated that if on introducing the hand and arm into the rectum, he felt a coil of a small bowel or intestine in front of him, he knew he had to deal with a twist. I am sorry to say my experience does not bear that out. Acting upon his statement some years later, when I was placed in the predicament of being situated hundreds of miles from everywhere, having to march early in the morning, and finding that a horse, on rectal examination, seemed to have such a coiled bowel in the pelvis, and was in extreme abdominal pain, I said, "I have no hesitation in recommending that horse to be shot; he must have a twist." The horse was shot, and I made my *post-mortem*, and I found not the slightest sign of a trace of a displacement. The bowels were perfectly normal in colour, but

there was a piece of hard material passing along the small intestine, and no doubt if it had had time to once get into the large intestines, the horse would have been perfectly relieved from pain, and been able to march, probably, the next day. As it was, I had the opportunity of demonstrating—at any rate, to my own satisfaction—that this loop of small bowel is by no means diagnostic. I bring that forward not so much to correct an error as to lay stress upon the fact that when the small intestines are twisted, loops no doubt do arise. We can feel those loops, no doubt, by rectal examination, and they may possibly indicate some displacement of the bowel. Whether this is the case or not, there can be no doubt that rectal examination in the case of abdominal disease is of the utmost value. It may be adopted half-a-dozen times and you learn nothing, and the seventh time you learn something. I never fail to examine all my cases through the rectum, and I am satisfied that I have in that way got hold of information which otherwise I certainly should have missed. With the small intestines no doubt these loops are to be felt, and if they are suspended in coils they generally indicate something present in the small intestine which has led to displacement, though not necessarily so.

In the human subject, vomiting is extremely common with small intestine obstructions, but nothing like so common when you come to deal with large intestine obstruction. The very worst case of vomiting I ever saw in a horse, was due to a twist about the middle part of the small intestine, somewhere about the jejunum. That horse vomited in a manner I never saw before or since, the stuff gushing from his nostrils. I have observed that you may have vomiting, or attempts at vomiting, in displacement of the small intestine, and one can readily understand why it should be so. Unfortunately the horse vomits so rarely that it is a symptom we cannot wait for or depend upon. We know it is more frequently present in another form rather than in twist of the intestine, but the point is when the horse vomits it does not at all follow that he has rupture of the stomach. If the other symptoms of rupture are not present, if there is no attempt at vomition, it is not impossible that it is small intestine trouble rather than stomach trouble.

A horse suffering from displacement of the small intestines, as a rule, has an absolute blocking; there is no passage of material. I find that in every one of my cases, I have recorded an entire absence of passage of fæces. The question arises, why should a twist of the small intestine lead to a non-passage of material? There are whole lengths of the large intestine suffering from no complication which are directly in connection with the anus; there is not the slightest reason apparently why they should not empty themselves. In my experience they never do. You may find on opening the horse that there is not a trace of anything wrong with the large intestine, except that the material there may be dry, or on the other hand, it may not be if we have been given enemas freely; but in the bulk of cases of twist of the small intestine there is no passage from the horse. I lay stress upon it for this reason, that my experience some years ago would have led me to believe that with small intestine trouble there is no reason why you should not get a passage, but with large intestine troubles you have little or no passage. It is undoubtedly the fact that when the small intestines are displaced or twisted, in the majority of cases the horse passes no dung whatever. Why is this? The only explanation is physiological. Such very great changes are set up in the nervous system as the result of a yard or two of the small intestine being twisted that the whole of the intestinal peristalsis ceases. You hear no rumbling in the abdomen. Apparently the whole thing has ceased to move. You can give drugs, but it is very much like pouring medicine into an ordinary tube. There is no peristalsis; it has entirely ceased as the result of this very serious alteration that has taken place in the arrangement of the small intestine. It is due undoubtedly either to the influence upon the phrenic nerve or

upon the splanchic which supplies both the small and large intestines. One question I would ask, which I hope in future you will observe, is this, whether there is less urine secreted when the small intestines are twisted than when the large are twisted or displaced? My own impression is that there is less urine secreted; in other words the horse does not urinate to anything like the same extent that he would do if the large intestine was twisted, or it was an ordinary case of bowel trouble, which would yield to treatment. It has been observed in the human subject that comparatively little fluid is secreted in such cases, and it was passed with very great difficulty. Should it turn out to be the fact that in the horse with small intestine trouble very little urine is secreted, it must give a very useful aid in diagnosis which at present we do not possess. It may turn out that there is no difficulty. I put it to you as a matter for your own experience and discretion, and I hope your future observation will clear up the point.

It is astonishing how rapidly these cases terminate fatally. In discussing cases of this sort with human surgeons they are surprised when one tells them that they will slip from your hands in a few hours. They say "we have cases bad for two or three days; we eventually operate, and they may recover or they may not; but they do not die rapidly." There is some very good reason why a horse with a complete twist of the small intestine should die very rapidly, and I suggest that the cause of their rapid death is due rather to the deep impression made upon their remarkably sensitive nervous system, or, on the other hand, it may be due to poison. If a horse is not manufacturing much urea he will have a certain amount of urea circulating in his system, but he does not live even long enough for that. However, we know there are certain products in the intestinal canal of the horse that are exceedingly poisonous. We have not the slightest difficulty in eliminating carbonic acid combined in the form of salts of potassium, which is extremely poisonous, and which would exercise its poisonous effect upon a healthy animal were it not that the liver stands in the road by diverting the course of circulation and neutralising the poisonous products. In the case of an animal with a twisted bowel the course of circulation is to an extent cut off, and it is possible—at any rate it might be enquired into—as to how far the extreme rapid death in these cases is really due to a poison which the animal is manufacturing in his own inside. Twists in the small intestine are partial or complete, and drawing a line between is simply a question of diagnosis. If you have a complete twist of the bowel your horse dies much more quickly than with a partial twist. If you have a partial twist there is a certain amount of circulation carried on. The result is that we do not get the same rapid collapse as where there is complete twist. We have had for many years what I believe to be the most egregious errors and doctrines laid down with regard to inflammation of the horse's bowels. I turn to the most accurate observer that ever wrote on veterinary science: I refer to Percival. Percival's symptoms are as good to-day as they were fifty years ago, and so far as his powers of observation go, we have never yet had a man to equal him. Percival describes inflammation of the bowel as due to inflammation of the muscular coating of the intestines, and we have had a large number of cases described as enteritis which in my humble opinion are not enteritis at all. Let me attempt to draw a clear distinction between enteritis and the appearance of a bowel which is strangulated. If you get a real typical case of enteritis, such as might be produced by an irritant poison, you do not get your peritoneal coat affected to any extent. It may be injected or it may not be, and the reason why it is not injected is because enteritis is not inflammation of the muscular coat of the horse's intestine at all. It is inflammation of the mucous lining membranes, and it is not until you split the intestine that you are able to say "that is enteritis." The mucous membrane is inflamed, inflammation may go to the tissue that exists between the mucous

membrane and the muscular coat; but you may have a bowel which is a deep red in the mucous membrane, yet externally there is little or nothing to show for it. Such is the case with pure undoubted enteritis, which is distinctly an uncommon disease with the horse.

But take those cases where you have displacement, and the blood supply is not only cut off to the intestine, but whatever blood happened to be in the bowel at the time it got twisted is blocked up, giving rise to all the subsequent *post-mortem* appearances. What do we find? We find the bowel spoken of as being "as black as your hat," an expression which very nearly does describe it, at any rate it is of a deep maroon, or blue colour, very dark; secondly it is very thick, the coats are rather more than the thickness of my thumb. You split it open, you find—not the condition of enteritis—what you find is blue-coloured ingesta, and the mucous membrane nearly as black as the peritoneal coat. These appearances are those of strangulation. If I put a ligature round my wrist my hand will be black to morrow, and later on there will be gangrene. That is the condition in which we find these intestines. We very often speak of it as enteritis, but for the purposes of accuracy that is distinctly misleading.

Now, turning to the large intestine, in which I told you, to start with, the displacement had only been discovered certainly within the last 20 years, we find the colon of the horse, enormous bowel as it is, weighing I do not know how many pounds when filled with ingesta, is capable of undergoing a most astonishing alteration in its course, and of really turning topsy-turvey in the abdominal cavity. At one time I considered that the majority of cases of twists of the bowel were due to horses rolling, and for many years I have not allowed them to roll. I still met with those cases, but they still died. They have not had any opportunity of rolling, and yet they get a twist. It has therefore been forced upon me latterly that some cause is operating in the production of twists other than that of rolling. What is that other cause? You perhaps see a glimpse of it when you have found the colon turned topsy-turvey in the abdominal cavity. That could not be produced by any acrobatic movement that a horse is capable of. I do not see how he could turn his colon upside down by rolling, but I can see that you may have some peculiar alteration, some erratic peristalsis in the bowel, which may do it for him. I should not have come to that conclusion had it not been that I have fonnd the cæcum turned inside out, and lining the colon. Now when you remember that the cæcum is an enormous bowel, and that the opening from the cæcum to the colon is extremely small, I would ask how this huge nightcap could have got into that hole and become completely inverted in the colon. It is quite certain that it could not be produced by rolling. It could only be produced by some alteration in the direction of movement of that intestine. I cannot explain what it is, but I can see that possibly in some way or other the whole thing gets drawn inside. I am not speaking of intussusception, but if I have a case where the ileum or the cæcum is drawn right into the colon I say that is produced by some erratic muscular movement. Now in the same way I say it is quite likely that some peculiar erratic movement may cause the colon in the abdominal cavity to turn upside down. Whether that is the explanation or not I cannot say. It simply suggested itself to me as a possible means of explaining what otherwise appears to be absolutely inexplicable.

The colon may be twisted in about eight different ways. Either the free end may be dragged forward, or the colon may be twisted completely to either side the diaphragm, or the whole colon may, first of all, apparently have been reversed towards the pelvis, twisted upon its own axis, and lay along the floor of the abdomen. It is impossible to give you any idea of the manner in which the colon may become twisted. It is capable of performing any number of

serpentine movements which you can conceive, and these movements constitute twist or displacement of the colon. Sometimes they are obviously associated with an entire non-passage of material out of the body. I have, however, seen even exceptions to that, for one of the earliest displacements of the colon I ever witnessed, was one where the pelvic flexure was up against the diaphragm. I remember that horse purged most violently for the first hour or two. It is perfectly possible for an animal to be passing material through the body for some hour or two after he comes under treatment, for the reason that you very seldom get a block of the canal next the anus; there is always a certain amount of material he may possibly get rid of which may lead us to believe that there is a passage through the intestinal canal whilst as a matter of fact it is occluded. When the material between the blockage and the anus is got rid of then a perfect condition of stoppage exists. Evidently where you have the colon twisted, the blockage or stoppage of the bowel is one of the most prominent features, and as in the small bowel you may have either complete or partial twist, so you may in the large bowel, the only difference is that the one case will live just about double the length of time that the other would.

If rectal exploration is of any value in small intestine twist, it is of double value in large intestine twist. I have extremely long arms, and I have not the slightest difficulty in feeling the horse's spleen or even the right kidney. What do I feel? On the right side of the abdominal cavity you feel the colon and you must feel the cæcum, but it is perfectly impossible to tell between them. Towards the floor of the abdomen you find again more bowel, but you can distinguish between them. You feel the bowel with something like a string on it. For years I never knew what that string was, and it was not until I dissected animals in the upright position that I found it out. All that it is is a piece of the peritoneum which connects the colon at what we used to call the horse-shoe flexure, what is now known as the pelvic flexure of the colon. If you can feel during life just where the colon is where this piece of peritoneum exists, you will not have the slightest difficulty in feeling this. The bowel is on the curve, and what feels like a string is simply the inner curve of the bowel. On the left-hand side we feel also large bowels, not so large in front as on the right side, and moreover distinctly movable. I would particularly draw attention to the condition of the bowel on the left side of the abdominal cavity, for this reason, that not more than eighteen months ago a paper was published detailing the experience of a veterinary surgeon in Copenhagen, who described that by feeling the arrangements of the muscular bands on the intestine you could say whether the horse had a twist in the colon or not. We know that so long as the intestine is occupying a normal position the bands will naturally take a normal direction. What is the direction of the normal bands in the horse? If you feel the intestine on the left side as I have described you may occasionally feel a band running along the top. There is another band on the outside which you cannot feel at all, lying right up in the horse's left flank. Jensen states that you may absolutely and invariably diagnose displacement of the large intestine of the horse by feeling for those bands. All I can say is that I cannot feel them, that is to say I cannot distinguish through the walls of the rectum these bands when the bowel is very distended. Therefore, although according to Jensen you may be able to diagnose displacement of the bowel from the position of the bands, I think in the majority of cases you will fail to do so. I have tried this experiment upon a dead horse strung up in the ordinary living attitude. I have had a hole made in the left flank, I have taken hold of the pelvic flexure and displaced it or turned it over, than I have an assistant or somebody else who puts his hand in the rectum, and I have said to him "What have I done?" He says "I can feel this and that;" "Can you feel

the bands?" "No." I have then replaced the bowel in its normal position; I have directed my assistant to make alteration in the direction of the horse's colon whilst I have seen myself if I could diagnose it through the rectum, but I never have been able to do so. I have only made what you may call "a shot at it." The fact of the matter is that through the walls of the rectum you cannot feel these bands, and the value of the bands as laid down by Jensen I consider to be *nil*, at any rate that has been my experience, actually putting the animal in the living position, making a window in the flank and seeing what we could do in crystallising this as a diagnostic symptom. When, however, the large intestine at its pelvic flexure is twisted and turned forward, instead of finding it on the left flank, you probably cannot find it at all. I therefore consider that examination through the rectum in cases of displacement of the large colon is more valuable than in the case of the displacement of the small intestines, for the reason that you can feel that this piece of bowel which ought to occupy the whole of the left flank occupies only a part, or is entirely absent. If I were called in to see a horse with abdominal pain, with the pulse I have described, and showing an expression of impending death, and I found that he had no colon on the left flank, I should say that in all probability the double colon was displaced. Whether turned forward or twisted on itself I cannot possibly say, but it is not where it ought to be; and I think you will find that a symptom of value. During all this time you hear no rumbling of the intestine, for at any rate in the majority of cases all movement has absolutely ceased; everything inside is as silent as the grave. I lay stress on that for this reason, that it assists one in determining whether you have a case of ordinary impaction, or whether the intestine is displaced. In ordinary impaction you may have the rumbling, although there may be no passage through the horse, still the bowels are alive; but in the case of a horse with twisted double colon or small intestine, the bowels to all intents and purposes are dead.

With regard to treatment, I have nothing to bring forward which is likely to revolutionise our treatment, or anything, except the surgical part of it, which is likely to be of any value where the intestines have become displaced. I believe that in physostigmine we have an agent not only of the very greatest value in ordinary abdominal cases, but also of diagnostic value. Supposing I inject into a horse three grains of physostigmine; if I have a reliable drug I know very well that I shall have a very marked action on that horse's bowel in all probability within twenty minutes, certainly within an hour. In the case of ordinary colic, due to spasm of the bowel, three grains will have very much the same effect, it will purge him; but if I have a case of twist of the small or large intestine I cannot purge him, there is no passage out of the body. Therefore the injection of physostigmine is an aid to diagnosis. If it produces action of the bowel in all probability you have no twist, if it produces no action in all probability you have twist. It will not enable you to say whether it is the large or the small intestine, but I look upon it as a very valuable aid. I would lay stress however upon this point, that it has been said that rupture of the bowel has resulted from the use of physostigmine, owing to the intense peristaltic action set up. It may be, possibly, in cases where the material is forced along the intestine at such a rate as to burst the intestine immediately in front of the obstruction. I have not met with it, however, and I lay no stress upon it. I do impress upon you the use of physostigmine as an assistant to diagnosis, as showing whether you have an ordinary case of colic or one in which something has blocked up the intestinal canal. Physostigmine, in order to get the very best results, should be combined with pilocarpine. Pilocarpine has a very peculiar effect upon the salivary glands, and a horse taking it will pour the saliva from its mouth. In cases of abdominal disease you never find any saliva in the

horse's mouth. The mouth is dry. If you give him pilocarpine you stimulate the salivary glands. There is a gland inside the abdomen closely relied to the parotid—the pancreas, and one advantage of combining pilocarpine with physostigmine is that you have the pancreas pouring out a considerable amount of fluid into the intestinal canal, and I can conceive in cases where you have an ordinary obstruction of gravel, sand, or hardened fæces, this pancreatic fluid poured out in such large quantities may assist mechanically in either pressing the obstruction along or in dissolving it.

Then again, these cases may be dealt with without medicine at all. For many years we contented ourselves with administering enemas to the horse by means of a tube with a piece of wood on the end of it, one foot in length or a very little more. Latterly, following on the lines of human medicine, we adopted a long tube, and in favourable cases we have no difficulty in passing the tube six feet in length into the horse; a tube six feet in length is better, undoubtedly, than one foot in length, but you must remember your six foot tube does not go up into the colon. It does not even get out of the single colon, it certainly never goes near the double one; but the advantage of the long tube is you can pump in a considerable quantity of fluid which undoubtedly acts mechanically by washing out any sand or gravel. I have had relays of men pumping for half-an-hour at a time, and as fast as they have been pumping in the sand has been coming out. The value of the washing out is undoubted. I have seen cases which could never have recovered under the ordinary system of enema giving, which yielded in the most marked manner to washing down the obstruction by large quantities of water. I do not think I have given a horse a warm enema for 15 years. I never use anything but cold water. I treat all my cases of colic with cold water. I have a tap in the yard with a piece of india-rubber hose put on to it. The tube is put in the horse, the tap turned on, and he stands till he cannot hold any more. You may say it will make him ten thousand times worse; all I have to say is, try it. Referring to the case of enema giving, they want thoroughly washing out either by means of the tube or the ordinary Read's pump attached to the long tube, so as to give the full benefit of it. There is a right and a wrong way of passing the tube. If you want to get it up some distance cover it with lard. Lard it right up to the end by the opening, in fact you may lard it right over the opening and then put your finger into it to open out a passage for the water. The lard gradually dissolves by the heat of the bowel, so that you have the lump of lard hanging round the end of your six feet tube, and the thing gradually finds its way along, the assistance which the lard gives being positively astonishing. In addition to this the use of hot rugs externally is of the very greatest value in giving relief from pain in acute abdominal cases.

As to the administration of agents for the relief of pain, I possess some rather peculiar ideas about opium. I have not given opium as an anodyne for 15 years, for it has a peculiar stimulating effect, which to my mind makes matters ten times worse. You can keep pain under control by Indian hemp or chloral hydrate, both agents of undoubted value in relieving pain, but so masking symptoms as sometimes to lead the practitioner astray.

I have said nothing about hardened fæces, colic, or about surgical treatment. My time has gone, but I should like to say one word on the last point, namely, surgical treatment in intestinal obstruction. "What is the good of opening that horse's bowel?" said a man on one occasion, "he will die." Of course he will die, and he will die for the reason, that at present, I do not know how to open the abdomen and manipulate the bowel, and yet cause him to recover. He will die because of my ignorance how to do it, but if I had a sufficient number of cases and learned how to do it, I ought to obtain exactly the same power in dealing with an abdominal wound that an

expert surgeon of a London hospital will have when he does not hesitate to open the abdominal cavity. We are practically in this position: we are all fighting shy of opening the abdominal cavity of the horse. We say, "No, give him a chance; we have seen worse cases recover." We have been working on that principle of "giving a chance" for a very long time, and we are making no headway. Twisting of the bowel is as fatal to-day as it was a hundred years ago. We ought, I think, to be able to do something for him. I do not say that every form of intestinal obstruction will yield to the knife. How often we make *post-mortem* examinations and are positively unable to undo the twist, after death, without rupturing the bowel. That is not a case which would lend itself to surgery; but we have cases which will, and which we ought to discover by making the needful explorations of the abdominal cavity. There are cases recorded lately where men have been bold enough to tackle these things, and yet the results have been fatal, and for two reasons: first, that we do not know how to do it properly. There was a time when they did not know how to do ovariotomy properly, so much so that the Royal College of Physicians issued an edict to medical practitioners and told them that men who were guilty of performing ovariotomy would be indicted before the coroner's jury. But to-day the mortality, instead of being 95, 85, and 80 per cent., is reduced to 8 per cent., because they know better how to do it now than they did 25 years ago. I take it that we do not know how to do it. We do not know the best line of incision. We do not know the best method of after treatment; but, worse than that, we do not know the right time to do it. These cases run their course so rapidly that every hour lost is equivalent to a day in the human subject. What we have to do is to learn methods of diagnosis. I should like some little attention paid to the question of observing the urine. Further, we must learn how to open the abdominal cavity. We must learn the best line of incision and of after treatment, and we must learn to do it sufficiently early to be able to do some good for the horse, because it is quite certain that opening the abdominal cavity when it is *in articulo mortis* can never result in anything but a fatal termination.

Discussion.

The PRESIDENT said they had all listened with very great interest to the address given by Professor Smith. It had been a very useful one, containing a good deal of information, and affording material for considerable discussion. He hoped that gentlemen present would show their appreciation of Professor Smith's endeavours to interest them by entering heartily into the discussion.

Mr. WHEATLEY said he wished to thank the professor for his very able address. They had heard a good deal that was quite new: in fact, some things that had never appeared possible or probable. Time of day was mentioned as having considerable bearing on cases as to whether they were likely to get well or not. His (Mr. Wheatley's) experience was that the reason that a horse brought early in the morning was not so likely to recover was that he had probably been ill during the whole night, or for some considerable time before he was seen by the veterinary surgeon. By that time the horse was frequently in almost a state of collapse. He could not say that he had himself noticed that cases occurring later in the evening were more likely to get well, for his practice was not much in the evenings. He, similarly to Professor Smith, laid a good deal of stress upon the pulse. They might see a horse in violent pain, but his pulse was not interfered with very materially. On the other hand, he might have a running-down pulse, so that they could, with a certain amount of certainty, say that he looked like dying. Another diagnostic aid was the appearance of the mucous membrane, seen either upon inverting the eyelid, or looking on the Schneiderian membrane. He agreed in thinking that rolling did not cause twist; in fact, it was

his practice to turn such a horse loose and let it do as it liked. He had once met with a curious case of stone in the colon. It was a valuable horse, and there was utter absence of the usual symptoms of abdominal pain. The horse was "Robert the Devil." He had been for about two days off his feed, that being the first symptom; he showed no abdominal pain. He (Mr. Wheatley) was sent for one morning at five o'clock, and found the horse simply standing and sweating. He had a very small pulse, very much accelerated. There was not the slightest sign of looking back at himself, no scraping; but the case terminated fatally. The *post-mortem* examination showed that the case was rather unique from the fact of the horse having an intestinal calculus, weighing about five pounds. The stone formed a pouch in intestine, and it had got out of the sac, and the only symptom was that the horse was off his feed. There was no rise of temperature; there was a small tear in the colon about three inches long, but the horse only lived 12 or 14 hours. He had noticed that a horse with a twist of the large intestine usually lingered longer than one with a twist of the small intestine. With regard to hot rugs, he would ask the Professor how he adjusted them to the abdomen. He himself used what they knew as a sweater or rug, about 3 or 3½ yards long and 1 yard in width. As far as he knew, that would keep hot absolutely. The difficulty was to keep it in its place with the horse knocking about with the abdominal pain. He used it more frequently in chest affections, but sometimes put it on the horse's abdomen. He would like to know how it was to be done, unless there was a large staff of men available. He might add that he had had the biggest calculus on record. It was a case of a mare, one calculus being taken from her weighing 37lbs., and another of 7lbs., making 44lbs. in all. The calculus was now in the possession of Professor Axe.

Mr. GOLLEDGE said there was one thing which had not been mentioned on the subject, viz., that of temperature. He (Mr. Golledge) held that where there was a quick pulse, and a temperature not high in character with the pulse, that that was a very grave symptom. He called a case to mind of a cow which was suffering from stoppage, which kept on for about a week. She ultimately died with a good deal of abdominal pain. On *post-mortem* a large quantity of the small bowel was found quite twisted on itself. In another case of a horse with sudden abdominal pain, he gave physostigmine, but got no action of the bowel whatever. On *post-mortem* a calculus was found in the colon. In another case, which was about for some considerable time, *post-mortem* showed a tumour in the colon. He was very much struck by the condition of the animal, showing no pain from the commencement almost to the death, and dying very suddenly. It might have been expected that after three days' suffering from stoppage by the tumour there would have been a good deal of rolling, but there was no rolling at all. He thought where they got stoppage from twisting of the large bowel they did not get the acute pain that was present in the small bowel, and that such a case lingered about for a much longer time than a case of stoppage of the small intestine.

Mr. JAMES SIMPSON said he wished to thank Professor Smith for coming to enlighten them upon many subjects upon which they did not, perhaps, feel as much at home as himself, owing to the great facilities that he possessed in observing cases, and which did not come within reach of the ordinary practitioner. He was very much struck with the statement that the displacement of the colon had only been observed during the last twenty years, and that by Professor Walley. If that were the case, it must either be due to the fact that displacement of the colon did not take place twenty years ago, or that the opportunities for making *post-mortems* were formerly very limited. He could hardly suppose that anyone on making a *post-mortem* could overlook so important an alteration in the position of so large a bowel. There could be no doubt that the ileum was more frequently than other bowels the

subject of twist or displacement, and a very reasonable cause was assigned by Professor Smith in the great muscular power which that bowel had as compared with others. In speaking of the various forms of displacement, and the insertion of knuckles of intestine into various holes in the diaphragm, they must all have noticed that when they did get a rent in the diaphragm, it was of remarkable extent. In making *post-mortems* of animals, and sometimes discovering these enormous rents in the diaphragm, he noticed an absence of anything like an old tear, and the question arose whether possibly those enormous tears might take place occasionally in the loading of the horse into the knacker's cart. He had seen cases of enormous rupture of the diaphragm, where there had been very little bleeding, and was, therefore, led to the conclusion that it really did not take place prior to death. He should like to hear if Professor Smith had ever observed anything of that kind. Undoubtedly continuous pain was a guide, enabling them frequently to suspect a twist or an obstruction from which the animal was not likely to be relieved. He thought that Professor Smith must have misunderstood the gentleman who was never guided by the character of the pulse. In abdominal pain the pulse was of the utmost value for diagnostic purposes, but would it enable them to say whether a case was likely to have a fatal termination or not? His own experience was that when called in to a case, say at eight o'clock in the morning, finding a patient with an extremely weak pulse, the chances of recovery were very remote. With regard to the time of day referred to, he agreed with Mr. Wheatley that if a practitioner was called to a case at eight o'clock in the morning, the chances were that the horse had had at least six or eight hours' illness before the arrival of the groom, and that possibly some two hours had elapsed before the veterinary surgeon was called in. In that case the disease had got an unfair start of the practitioner, and that quite accounted for the large proportion of deaths occurring in cases brought early in the morning as compared with those occurring later in the day. In the ordinary way, if an animal was taken ill, say at five in the evening, the men would not delay sending for the practitioner as soon as possible in order to avoid their remaining up all night, and that would really account for the majority of the cases to which they were called in the evening or at night, recovering. He did not agree with Professor Smith as to physostigmine being an aid to diagnosis, and that in an ordinary case of bowel impaction or colic, they would get a comparatively immediate action as the result of its administration. In his own case, the administration of physostigmine had been extremely disappointing. He frequently got very good results from it, but, on the other hand, he had administered it over and over again to the same patient with no result whatever, and the patient, if the case terminated fatally, had on *post-mortem* proved not to have suffered from obstruction, but from inflammation of the bowels. He disagreed with the Professor as to the rarity of cases of inflammation of the bowels, being able to call to mind many such cases which had followed colic. He also disagreed with the idea that inflammation of the bowels was confined to the mucous membrane, believing as he did that in many cases the muscular coat was also very extensively involved. As to rolling producing twisting of the bowels, he agreed that it had absolutely nothing to do with it. He knew a London practitioner who adopted the same treatment as that suggested by Mr. Wheatley, choosing his largest and softest-floored box, and allowing the patient to roll about as he chose. He was referring to a practitioner who enjoyed a very large practice, and had the opportunity of seeing a number of cases of abdominal disease. He was in hopes that Professor Smith, in dealing with the causes of twist, would have given his idea of the cause of many of those cases. He had mentioned what, in his opinion, would not produce a twist, but he did not state what would do so. It would be interesting to know something more

about the theory of muscular contraction producing the condition of affairs referred to. Rectal exploration was undoubtedly of very great value, but he (Mr. Simpson) had not been able to satisfy himself as to what really existed in the case of a twist by that means of examination. Although he had often had a suspicion, he had never had sufficient confidence in the judgment formed to boldly state it to his client, seeing that if that opinion happened to be wrong, it would be so clearly contradicted on *post-mortem*; and in the event of a practitioner having foretold that a twist of a certain intestine was the cause of the death of the animal, it would be a little surprising to the client, and a little mortifying to the veterinary surgeon to find some other cause of death. The administration of pilocarpine was a course he had never adopted, but it happened for the reasons given that it might be an extremely reasonable treatment in cases more particularly of impaction of the bowels, and one could understand that the larger the amount of fluid that could be secreted in such cases, the greater the chance the animal had of recovery. With regard to the long tube for injections, the treatment was becoming more popular, but he had not himself adopted it. He was generally content to use the ordinary Reed's pump with a recognised method of tubing, and some two, or at the outside three feet, was the greatest length he had ever had passed into the rectum. He knew that practitioners had used the long tube with very great success, and he rather blamed himself for not having given it a fair trial. He was rather impressed with Professor Smith's statement as to the use of cold water injections. No doubt there was good reason why simply warm water should not be used, because if it was below a certain temperature, it acted upon the bowels as a sedative. The students of the present day were taught to stimulate the bowel, and if injections were given with that object, they should no doubt be as warm as a horse could well bear upon the mucous membrane. The use of cold water internally seemed a little opposed to the use of hot fomentations externally. Doubtless there was good reason for this, and it would be interesting to hear Professor Smith's argument for adopting this course of treatment. The adjustment of hot rugs was a matter that had puzzled older men than Mr. Wheatley. No doubt, if a hot rug could be placed upon the abdomen of a horse in abdominal cases, it was of the very greatest value, but to have rugs partially wrung out, with the cold water running down the legs, was most objectionable. In violent patients it was difficult to satisfactorily secure the hot rug to the abdomen, and the best way of fomenting the abdomen was to have a man on either side of the horse, and to apply the hot water as long as possible. Like Professor Smith, he had almost discontinued the use of opium, and he was bound to say that the percentages of death when he used opium, were far in excess of those since he had used the chloral hydrate. It was a most excellent remedy, and in his experience, it did not veil the symptoms. He should be very glad to hear something more on the question of surgical treatment. They had yet much to learn, especially with regard to the opening of the abdomen, and were, no doubt, waiting for one another to experiment. He certainly was in that position, having no desire to pose as the discoverer of a method by which abdominal trouble might be surgically relieved. He hoped that something more might be said upon that part of the subject. He did not agree with Professor Smith that wounds in the bowel would heal as readily as any other, his own experience being that if he was unfortunate enough to get a puncture of the abdominal walls, and the bowel was involved, the case, nine times out of ten, terminated fatally.

Mr. J. D. BARFORD said the subject of the paper was most useful as giving information on a matter of ordinary practice. The distinction between the effects of stoppages in the large and small intestines had been very admirably detailed. The various methods of treatment had also been

very ably dealt with, and the whole address would be most useful to them as practitioners.

Mr. C. PACK (Hon. Sec.) said, while thanking Professor Smith for his able address, he would say a few words with regard to twists. The causes of twist had always been a puzzle. They knew horses that had twists that had rolled, and horses that had twist that had not rolled. He remembered the case of a hunter which made a blunder at a small ditch; it did not go down but recovered itself, and though afterwards the horse did not go with his usual energy, he was kept going. In the afternoon as he was being walked home quietly the horse was found to be uneasy and appeared to have colic. The horse's head was tied up, and in an hour or two he (Mr. Pack) was sent for. The horse certainly did not lie down after he saw him. The pulse gradually crept up, temperature increased, and it was evident that there was some serious internal lesion, but it was too early to form an opinion what it was. He noticed the mucous membrane, and repeatedly looked at the eye, but it did not change colour at all. After some two or three hours he told his client that the horse had twist of the bowel. His client said it was impossible, that the horse had never gone down. He (Mr. Pack) said he felt certain as to the lesion because of the increasing pain and temperature and pulse, and he thought that it was either a mesenteric hernia or a twist of the bowel. The horse died the next day. There was very little tympany and no passage. On the *post-mortem* he found that there were about 18 inches of one small intestine completely twisted, and the horse must have done it when he made the blunder at the ditch. With regard to twists of the large intestines he had seen three cases where the colon was twisted. The first two cases he attributed to enteritis, but he believed that was a mistake. The thickness of the coats of the large intestine that was twisted, and the appearance as laid down in the text books led him to conclude that it was enteritis. He afterwards satisfied himself that there had been a displacement of the large colon, and that it was a case of twist. He had recently had two cases of sand colic, one in a cart mare, in the spring of the year, which had been colicky some half dozen times in the preceding 12 months. This time it did not yield to treatment and went on for about a week. One day he found her down, with the pulse about 50 or 52, the temperature not being much raised. He wished her to be sent to his stables, but before she came he gave her an injection of physostigmine. The mare died before reaching the stables, having a distance of some five miles to come. It appeared that when the carter went in half-an-hour after the injection of the physostigmine he found her down, in very great pain. He got her up, and thought she might walk off the pain, but when she had got two miles on the road it was thought better to take her back: this was done, and she was dead in about 10 minutes after reaching home. The *post-mortem* showed a large rent in the colon, and they came across a pailful of sand and stones. The bailiff said he could recognise where they came from, because there was one field where all the top was laid with black stones and peculiar colored sand. She must have swallowed the sand and stones during the preceding year when turned out to graze, because this was in the spring of the year when the mare had not been turned out to graze for five or six months. Later in the season he met with another case of colic. On making a rectal examination he was surprised to find his hand covered with sand, the horse was purging in that instance. He put on the enema pump, swilled out the rectum and caught the excreta, carefully washing it, and found something like a pint of sand left at the bottom of the bucket. By the means of a liberal supply of oil and plenty of enemas the horse recovered. As to whether rupture of the bowels was produced by the use of physostigmine, he came to the conclusion that in the case in which he injected it it had done so because the rent was not found at the place where the sand

lay in the colon, but about a foot or 18 inches from it. In his opinion there was certainly no rupture of the bowel when he gave the injection, but within three hours the mare was dead, with a large rupture of the colon. With regard to what might be considered the most frequent cause of twist and displacement, he understood Professor Smith to say it was due to some extraordinary or perverse peristaltis. Undoubtedly when they got these impactions they got very little rumbling in the bowels. When physostigmine was first introduced he experimented upon an old mare, injecting the physostigmine into the jugular vein. The mare was suffering with large calculus in the colon. No fæces followed the injection, but there was a tremendous lot of rumbling, showing that they got all the action of the physostigmine. The place of injection made a great difference. He had injected under the skin without getting any action at all, whereas, if half the quantity was injected into the blood-vessel, the action was greatly increased. In almost all cases where he injected into the jugular vein the desired result followed. He had for some time discarded the use of the long wooden tube sent out with the ordinary Reed's pump, and found that fixing the metal bulb used frequently for pumping fluids into the stomach answered very much better. He could never get the tube to pass very far in, possibly because he had not smeared it with lard. He found that when it was sometimes thought that four or five feet were passed in that the tube had actually turned round and come back again. With regard to syringes, on one occasion a pony was brought in early in the morning, and there being no assistance to be got he was obliged, in the place of the enema pump, to use a syringe holding about a quart. After injecting one quart the pony, which was a ticklish one, managed to run back, and before he could get the tube out of the way it had backed to the wall. About an hour afterwards blood was found coming from the rectum: a rent was discovered and the pony died. He mentioned this as a caution against using syringes without having someone to help. Hitherto he had always used hot water as an injection, having the idea that it soothed the pain. If there was any contraction of the bowels he had always found that a warm water injection relaxed the spasm and relieved pain. He had tried opium, and chloral, but not Indian hemp. With regard to combining the pilocarpine with the physostigmine, he would ask Professor Smith to state the proportions—whether a full dose of each should be given or a half dose. As to surgical treatment he had never had any experience at all.

The PRESIDENT said reference had been made to the facilities possessed by Army veterinary surgeons for making observations, beyond those open to the general practitioners. No doubt that was true, but at the same time more facilities were open to all of them than were always availed of. Notes made of interesting cases would come in very useful at times, and would help to unravel the mystery of disease for the benefit of those who came after them. The subject of rectal exploration was most interesting to him. He noticed from rectal exploration in cases of colic that they often found on the right side the small intestines misplaced, and he used to think that was a case of twist, and diagnosed a fatal result. He found, however, that case after case got better, and therefore did not attach so much importance to it now as he did. In cases of impaction they frequently found pelvic fracture of the colon resting back in the pelvis, a kind of elbow resting on the bladder frequently giving rise to straining to pass water. He had overcome this frequently by getting the back of his knuckles to work pushing that back. It was new to him how they could get vomiting from obstruction of the small intestine and without stomach derangement. The old teaching was that they could not get vomiting, and he had never known a case recover after vomition. In cases of impaction the urine was generally suppressed. There was seldom much water in the bladder, but there was frequent straining showing that the

urine must be somewhat irritating to the neck of the bladder, owing to a smaller secretion. In pure enteritis, such as occurred from swine fever, they only got the mucous membrane affected as in every case of fever. As to the rolling, he had a loose box without manger or anything at all, and if a horse was brought with colic he was put into this box and allowed to roll about *ad libitum*. With regard to the administration of physostigmine to excite peristalsis in cases of abdominal pain he thought the result might sometimes be to aggravate the disease. Nature would try to get rid of a foreign body, and violent straining would take place. The treatment consisted in allaying the peristalsis, and then the calculus would come away. He had been more successful by that line of treatment than by encouraging peristalsis. With regard to surgery they often, in making a *post-mortem* and finding a little bit of twist, wished that they had just had pluck to cut down to it. He remembered one case where a doctor's horse died of strangulation of the small intestine. The doctor asked why he did not cut down on it, it was done every day in human surgery. The twist, however, in that case took two or three minutes to find when the horse was dead, and it would have been a most difficult thing to do in the living horse. There were, therefore, great difficulties in the way of surgery. He had on the table a large collection of stones taken from an 11 years' old carriage horse. It was a rank crib biter and he would ask whether Professor Smith had ever noticed in these bowel affections that crib biters were more affected than others. This horse got loose in the night and drank about three pails of water. When he was called in early in the morning he found the horse in violent persistent pain with profuse perspiration. This lasted about 36 hours, and as the case was evidently hopeless the horse was killed. On *post-mortem* he found that the stones had not anything to do with the death; they were in the colon just about the sigmoid flexure. The colon was atrophied in appearance. The cause of death was strangulation of the ileum, which had passed through the mesentery. Fifty-nine stones large and small were taken from the colon.

Professor Smith did not state the time a horse might be affected with impaction of the bowels without causing death. He used to consider one or two days a long time, but in one case last September a mare had practically no action of the bowels from the 9th to the 22nd. She commenced kicking in harness, got over the pole, and injured herself in the flank, and presented all the symptoms of bowel obstruction. The bowels were kept quiet. On the 22nd she recovered and went to work for about ten days. She was then taken suddenly ill and died. A *post-mortem* was not made by him, but the knacker brought him the large hard lump exhibited, and said there was a rupture of the bowel. He was at the same time attending another horse from September 8th to the 22nd with bowel obstruction; that made a recovery and went on all right afterwards. This showed the long time a horse might be affected, for these two horses had practically no satisfactory action of the bowels for a fortnight. In another case a three-year-old cart-horse went from September 24th to 30th, 1891, without any action of the bowels. Chloral was given, and on the 30th a large cake of dung came away, and the horse made a good recovery. Those were cases in illustration of what a horse might go through and the time he might be affected. He also drew attention to the fact that these cases of his all occurred in the month of September.

Professor SMITH in reply expressed the pleasure it had been to him to listen to the many questions put, aud to think that his address had been the means of stimulating a very excellent discussion.

Mr. Wheatley thought that the fact of cases coming early in the morning often terminating fatally might be due to their not having been brought to notice earlier, that explanation would be reasonable were it not that in the particular case referred to he knew perfectly well that that had not happened.

There were men on duty all night who would have found if the horse were ill, and, moreover, if a horse had been kicking about the best part of the night he would generally carry some sign on his body. He (Professor Smith) still thought therefore there might be something in the time of day, owing to the fact that they undoubtedly got their cases in a very short time after they occurred. He did not mention the mucous membrane for the reason that he was disappointed in the mucous membrane excepting in cases of rupture, where they undoubtedly got as a rule, profound discoloration of the membrane of the eye. His experience was that in twists of the ileum there was no alteration of the mucous membrane; in other words the fact of the mucous membrane not being altered did not at all preclude the idea of twists.

With regard to rugs, he used an ordinary rug in three or four thicknesses with three straps on one side and three buckles on the other. The rug was rather less than a yard wide, and sufficiently long to go right round the body. It was placed in a huge pan of boiling water. It was only soaked partially so as to prevent scalding the loins, and to give the men a fairly cold piece of blanket to hold by. The rug was twisted until nearly screwed in halves, to prevent the cold water running down the legs, and then put on at once before the horse knew anything about it.

In reply to Mr. Simpson he did not remember to have seen a rupture of the ileum. (Mr. SIMPSON: I have never seen but two myself). He did not refer to temperature; the reason being that he was disappointed in it. At one time he thought it would enable them to distinguish between fatal and non-fatal cases, but in his experience it did not. As to *post-mortem* rupture of the diaphragm, it was fairly constantly met with, and there was not much difficulty in determining between a *post-mortem* and an *ante-mortem* rupture. They generally occurred in two different places. Rupture during life occurred more commonly in the muscular portion; after death it occurred both in the muscular and tendinous portions. There was a peculiar appearance about the tear in each case which was unmistakable.

With regard to enteritis he could not agree with Mr. Simpson and other speakers that it was a fairly common disease.

He wished he could throw some light on the cause of twist. If they took the small intestines of a horse, placed them on a table and pumped them full of air it was curious to see how they behaved. Supposing the weight of bowel thrown over the coil which had been blown up was sufficient to prevent the gas from passing on; if they continued pumping, the coil would stand straight up on the table, and of its own weight would flop over and produce a twist Further, there were great differences in the length of the mesentery of the horse, and one with a long mesentery was more liable to twist. In speaking of twists of the large colon, he had to shield his ignorance behind the perverse or erratic peristalsis he had spoken of. He could see no other explanation. No doubt cold water injections were opposed to hot rugs, and he should never have thought of using them had it not been that the very able practitioner who preceded him had never treated cases of colic with anything else but cold water, and, not wishing to upset the routine practice, he continued it, and had kept to it ever since. Chloral hydrate was, he thought, a perfectly safe remedy, and he had no wish to cast any doubt upon its value as a therapeutic agent, but it did veil symptoms sometimes, for the reason that it kept the horses quiet.

Mr. Simpson had spoken of wounds of the bowel being very fatal. That largely depended on whether there was any leakage of the contents into the peritoneal cavity. If they had a wound of the bowel which caused the contents to fall into the abdominal cavity, peritonitis would almost certainly follow; but the bowel might be punctured in half-a-dozen places without giving rise to leakage or inflammation. In human surgery the intestines were

opened very freely, but the greatest possible care was taken to avoid any chance of the contents of the bowel leaking into the peritoneal cavity.

With regard to the curious case mentioned by Mr. Pack, he could not see how the twist could be explained by the blunder in the hunting field. A fall would, no doubt, produce a rupture of the diaphragm by the sudden weight of the horse's bowel.

The dose of Indian hemp would vary according to the nature of the extract. If it was very reliable they ought to get the full effects with an ounce of the extract. It was recognised, however, that the blood apparently held the alkaloid in very varying quantities. He did not reduce the dose of physostigmine when adding pilocarpine. He used one grain of pilocarpine to three grains of physostigmine. The place of injection was most important. In one case, where it was injected into the trachea, peristaltic action set in almost before the needle was out. The solution used was three grains to an ounce. There was no fear of suffocation, the fluid being absorbed almost as fast as it was put in. A better effect was got in that way with a milder dose. If it was injected under the skin he should, probably, give another half grain. He had known flexure of the colon in the pelvic cavity to be mistaken for the bladder; he had done so himself. No doubt the right treatment was to manipulate it gently and press it back, otherwise it might lead to serious trouble. No doubt the case of a horse recovering from vomiting was extremely rare; he himself had not seen more than three such recoveries. He certainly should not give physostigmine to a horse if he knew he had a twist; but he did not know it. All he knew was he had an obstruction of the bowel, and he had to weigh the probabilities and chances. Having done so, and administered his drug, he endeavoured to judge from the manner in which it behaved what the mischief really was, and if there was no result, the probability was that the bowel was occluded. In a case where there was no physiological action, he should say the dose was not sufficient. He should not certainly excite peristalsis if he thought he had a state of affairs like that, because he should be rather asking the bowel to give way.

He should say that crib biters were certainly more liable to colic, but not to calculus, than other horses. The question as to the length of time a horse might live when affected by a fatal disease of that kind was a very interesting one. He had never met with a horse that lived longer than six days, and generally the outside period was about three days.

He had been asked to say something more as to the circumstances under which he would open the abdomen to ascertain what had gone wrong, or whether the cause could be removed by surgery. He should open the abdomen in any case about the third day, and he was driving it off very late for the reason that they knew that some very unpromising cases pulled round. Certainly on the third day, if there was no passage, the abdomen might be opened. In reply to the question as to what he was likely to find inside which could be remedied by surgical interference, he would say: a simple loop of bowel being displaced, the pelvic flexure of the colon being turned forward, a calculus impacted in the single colon, a collection of hardened fæces in any portion of the bowel, or a collection of sand or gravel. In one case, after operating, he was surprised to find, on examining the bowel, that although the horse only lived eight hours, his sutures were completely glued over with lymph, and the peritoneal edges were absolutely adherent. There was no attempt at leakage into the abdominal cavity. No doubt in cases of calculus such a method of operation would be extremely valuable, or in a case of simple kink of the bowel.

On the motion of Mr. JAMES SIMPSON, seconded by Mr. PACK, a hearty vote of thanks was accorded to Professor Smith for his able and interesting address.

YORKSHIRE VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this Association was held on October 26th, at the Queen's Hotel, Leeds. Mr. A. W. Mason, F.R.C.V.S., the President, was in the chair, and amongst those present were Messrs. J. M. Axe, Doncaster; Thos. Pratt, Ripon; J. C. Collings, Otley; F. W. L. Clough, Morley; A. McCarmick, Leeds; H. Snarry, York; F. Thompson, Harrogate; Jas. Cooke, Scarboro', E. H. Pratt, Rawdon; G. Pickering, York; Geo. Hardie, York; P. Deighton, Riccall, York; B. Smith, Barnsley; M. Robinson, Barnsley; J. Clarkson, Garforth; W. Collinson, York; J. W. Anderton, Skipton; H. Pollard, Wakefield; J. Atcherley, Harrogate; J. H. Sowden, York; F. Somers, Leeds; J. S. Carter, Bradford; S. Wharam, Leeds; Messrs. G. H. Simpson, C. Steel, R. S. White and Prof. Penberthy, visitors, and the Hon. Sec., W. F. Greenhalgh.

The HON SEC. said he had written to Mr. Fryer asking him to reconsider his decision as to retiring from membership of the Association, but he had received no reply. He had received letters of apology from Professors Williams and Axe, Messrs. Greaves, Briggs, Halifax; Longhurst, Hull; and others.

Mr. G. J. Simpson, Leeds, was nominated as a member of the Society.

It was decided to request Professor Penberthy, Mr. Hunting, and Dr. Fleming to become associates of the Society.

Election of Officers.

Mr. CLARKSON proposed, and Mr. PICKERING seconded, that Mr. Cooke, Scarboro', be the President for the ensuing year. This was carried.

Mr. COOKE, in returning thanks to the members for the honour they had conferred upon him, gave his assurance that nothing would be omitted on his part to forward the best interests of the Association.

Messrs. Robinson and Pratt were elected vice-presidents, together with the retiring President, Mr. Mason.

The CHAIRMAN said he was sure they would be sorry to hear that Mr. Scriven, their respected hon. treasurer, was ill. For 23 years he had been a member of the Association, and he had never missed one of the meetings until that day. For ten years he had been treasurer of the Association, and he had pleasure in submitting him for re-election to the office.

On the motion of Mr. DEIGHTON, seconded by Mr. PRATT, this was carried.

Mr. CLARKSON intimated that Mr. Greenhalgh had definitely decided not to again accept the position of hon. sec. For a number of years he had allowed himself to be re-appointed under considerable pressure, but he (Mr. Clarkson) anderstood Mr. Greenhalgh would not accept office again. He therefore proposed that Mr. Frank Somers, Leeds, be appointed hon. sec.

This was seconded by Mr. Thompson, and carried unanimously.

The CHAIRMAN: Gentlemen, I do not think, as your President, I can allow this to pass without a few remarks from me. Knowing Mr. Greenhalgh so well as I do, I knew he would not stand again for the position under any circumstances, so that it was absolutely superflous to propose him. The position of hon. secretary of this Association demands the expenditure of considerable time, which I am aware Mr. Greenhalgh, with his extensive professional engagements, is not now able to devote to our service. I think my friend feels that some new blood should be brought into this Associatton, with a view of stimulating it, as it were. I should like to suggest that some member propose a vote of thanks to Mr. Greenhalgh.

Mr. PICKERING: I am very sorry our friend, Mr. Greenhalgh, doesn't feel inclined to hold the position of secretary to this Association for another year. I am very sure the best thanks of this Association are due to him for the way

in which he has discharged his duties for many years. I am sure we have all desired he would continue in office, but as it appears he is fully determined to resign, we can only render to him a hearty vote of thanks for the excellent manner in which he has discharged his duties for years past.

Mr. COOKE: I beg to second that.

The motion was carried.

Mr. GREENHALGH: Gentlemen, thirteen years ago I was elected an official of this Association. For three years I was treasurer, our hon. sec. being the late Mr. W. Broughton. Afterwards I accepted the position of secretary, and for ten years I have discharged the duties of the position. Under these circumstances, I think you will excuse me from taking office again. Mr. Frank Somers will discharge the duties of the office in a thoroughly efficient manner I feel certain, and probably he will be able to do better for you than I have done. Perhaps in some respects the Association is not in such a flourishing condition as it used to be. At one time we had no less a sum than £111 in the bank, but that sum has been expended in various ways by the resolution of the members of this Association, and I venture to think such expenditure has been well and wisely made. Then you must consider our expenses are heavier than they used to be. In the early days of the report of the meetings appearing in the journals were of the most bald description, supplied as they were by the secretary. Some years ago we commenced to employ a reporter, who has since supplied full reports of the proceedings of this Association to the journals. In this direction the Yorkshire Association was, I believe, the first to move, but almost all the other societies have now followed our example. This good old Association has done good work in the past, and I hope and trust, nay, I feel assured, the scope of its usefulness will not be decreased in the future. I beg to thank you.

The CHAIRMAN pointed out that the Midland Counties Association had a printed list of the members and their addresses, and it was decided that such a list of the members of the Yorkshire Association should be got up, and circulated along with the notice convening the next meeting.

It was decided to request a number of the leading men in the profession to become associates of the Society.

Mr. PICKERING thought it would be well if they asked members of the medical profession to become associates, and he gave notice that at the next meeting he would move a resolution to that effect.

Mr. SOMERS thanked the members for electing him hon. secretary, and then called the attention of the meeting to an article which had appeared in the *Leeds Mercury* of recent issue, entitled, "Veterinary Knowledge for Farmers," by Professor J. Wortley Axe. He said: I understand this to be one of a series of articles. As far as I can see, I think it is trespassing upon us as veterinary surgeons. Surely, gentlemen, farmers are well able to pay for any veterinary information they require. It is said, "a little knowledge is a dangerous thing," and perhaps these articles will cut two ways, but I think if any such a course was pursued in the medical profession, the matter would not be allowed to drop quietly. He further said he would again bring the matter up at the next meeting.

Mr. PICKERING: I think we, as members of this Association, ought to take some steps with regard to a paper like this being written for and published in a newspaper. At certain seasons of the year we, as a rule, have comparatively little to do, but our expenses go on just the same. We cannot canvass for our work or advertise our profession. I think it is hard enough to get an honest living as professional men without giving farmers advice gratis, especially in public papers. I find that Messrs. Day and Hewitt are distributing along with their medicine chest a lot of gratuitous advice. My opinion is that, as a rule, the advice does not do much good to those who

accept it; but, all the same, it is given. I think we ought to be banded together with regard to drugs, and also fees. I think it would be a good thing if Mr. Somers would re-open this subject at the next meeting. I think these societies have been of very great benefit, not only to the members individually, but collectively, and I think, as an association, some steps ought to be taken to remedy this evil, and let it be known through the journals that we disapprove of this kind of thing.

Professor PENBERTHY: I will not deal with this article as it appears to-day; we will let the paper slide altogether. As one of your representatives on the Council, I am extremely anxious that that body should see a sense of duty upon a point which is very closely related to this. In some of the agricultural papers and the sporting papers it is a common practice to ask questions and receive answers. If you take up almost any farming paper you will see questions such as this: "I had a cow that was very ill; we call our vet. to her; he said she was suffering from a skin disease. We killed this cow, and the cow proved to have some disease of the kidneys. Would the veterinary editor tell us whether our veterinary surgeon ought to have told us that the cow had a disease of the kidneys?" The editor replies: "Certainly the symptoms ought to have told him that the cow was suffering from kidney disease." When we come to such replies as that I think we have ground and cause for complaint. That is a matter which I myself, personally, and the Council generally mean to press as hardly as we can. We shall not only threaten to strike off the men from the register who are engaged in such nefarious practices. I bring the matter before this Association because it is of importance. I hope the Council may know they are receiving your support and appreciation in the steps they intend to take in this matter, and from the reception which my remarks have met with I have no doubt as to your feeling in the matter. When it comes to this, that a veterinary surgeon is led in a public newspaper to speak of the professional treatment of one of his brethren, I think the time has come that we should shut it up. We have perfect power to strike these men off the register. The thing lies in your hands. We must know whether the members of the profession desire such a thing should be done and this can only be brought about by the distribution of this knowledge through the press—through the reports of such meetings as we have to-day. I am sure of the spirit in the Council to put down any of this kind of advertising—this kind of blaspheming your neighbour's good reputation, to remove his practice and place discredit upon the profession generally.

The PRESIDENT: I am sure we heartily endorse everything Professo Penberthy has said. The only way to help the Council to stop the present mode of procedure is the expression of disapproval by such associations as this. Only let the authorities in Red Lion Square know you mean business and they will stop this thing.

Mr. THOMPSON: It will be three months before we have another meeting, and I therefore beg to propose "That the Yorkshire Veterinary Medical Association notes with great regret the series of papers on veterinary matters appearing in the *Leeds Mercury*, and that our Secretary be requested to write a letter to that effect."

The PRESIDENT: To whom?

Mr. THOMPSON: To the gentleman who writes the letters.

Mr. CLOUGH seconded this and the resolution was carried unanimously.

Mr. CLARKSON pointed out that some time ago a number of similar articles, appeared in various papers the authors being Messrs. Gresswell, of Louth and a similar course of action was pursued, but he believed he was right in saying that nothing came of it.

The PRESIDENT: Yes, that is so.

Mr. CLOUGH described a case in which he had attended a number of horses who had suffered from diarrhœa, great debility and stiffness, for awhile he failed to trace the cause of the disease, but ultimately he discovered that the corn upon which the animals were being fed contained no less than forty per cent. of Indian pea, and on the corn being changed the animals recovered. He had no doubt that this pea caused all the mischief.

Mr. AXE said he had met with several cases of horses having become seriously indisposed from feeding on these peas.

Mr. DEIGHTON, Riccall, mentioned that he delivered a cow recently of a calf which had horns an inch and a half long—he mentioned this as being very remarkable.

Professor PENBERTHY then read an exhaustive paper on "Anthrax;" the report, along with the discussion, will appear in our next issue.

FRANK SOMERS, *Hon. Sec.*

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

A MEETING of this Society was held at the Albion Hotel, Lincoln, on October 25th. In the absence, through illness, of the President (H. J. Goodall, Esq.), the chair was taken by Mr. H. Howse, one of the vice-presidents, and there were also present: Capt. Russell and Messrs. T. A. Rudkin, Grantham; W. H. Brooks, Leadenham; T. E. Smith, Market Rasen; C. Hartley, and C. Seeley, Lincoln; F. A. Holmes, Hemswell; and J. A. Robinson, hon. sec., Market Deeping. Capt. M. H. Hayes, F.R.C.V.S., Melton Mowbray, was also present as a visitor.

The minutes of the last meeting having been taken as read, Captain RUSSELL suggested that a telegram of condolence be sent from the meeting to the President, wishing him a speedy restoration to health. This was done, and during the meeting a reply was received that there was a slight improvement in Mr. Goodall's condition, and thanking the members for their kind expressions of sympathy.

Apologies for non-attendance were read by the SECRETARY from Profs. Williams, Pritchard and Penberthy, Dr. Fleming, C.B., Messrs. Greaves, J. A. Clarke, Dickinson, Freer, Gooch, Hardy, Reeks, Jas. Smith and Weston.

A letter was also read from Professor Walley, thanking the members for the vote of condolence sent from the last meeting at Peterborough, and regretting that owing to his being invalided at Jersey, he was unable to be with them.

The following letter was then read:

Royal College of Veterinary Surgeons,
10, Red Lion Square, W.C.,
October, 1894.

DEAR SIR,

I am desired by the President to say that the subject of a grant of money to the British Institute of Preventive Medicine will come before the Council of the Royal College of Veterinary Surgeons at their next meeting, and that should your Society desire to subscribe, it would guide the Council in their deliberations if they knew the sums which might be expected from each Society as supplementing the grant of the College.—I am, yours very faithfully,

A. W. HILL, *Secretary.*

J. A. ROBINSON, ESQ.

Capt. RUSSELL suggested that if the Institute felt inclined to pledge themselves to carry out the suggestions of the Royal College, he thought this would not be a bad opportunity to say what they (the Lincolnshire Society) were prepared to do. It would strengthen the hands of the Royal College if

they knew what the associations up and down the country would contribute in this respect. Their own funds were in a healthy state.

Mr. HARTLEY thought they might perhaps pledge themselves to a certain amount subject to certain conditions.

Capt. RUSSELL said the Society might send them a cheque for £5, which Mr. Hartley assured them would be gladly accepted.

Capt. RUSSELL then moved this formally, and it was seconded and adopted.

Mr. HOWSE proposed, and Mr. HARTLEY seconded, that Mr. Frank Bowman Eve, Louth, be accepted as a new member. Carried *nem. con.*

Captain HAYES, F.R.C.V.S., then addressed the meeting on—

"BANDAGING WITH PRESSURE, AND HAND RUBBING."

He said: Mr. Chairman and Gentlemen,—I am happy to say that although I shall be able to expound the subject before us in a few sentences, it is one of immense practical knowledge, and will furnish ample food for reflection, if not for discussion.

The primary results to be obtained from the application of pressure and massage is the removal of exudation from tissues in which it existe in an abnormal amount, from injury, from weakness, or from disease. In sprains, the pressure of extravasated blood and excess of *liquor sanguinis* causes separation of the ruptured fibres, and interference with the circulation of the part, so that accurate repair becomes impossible, and the tissue becomes permanently weakened. Besides such untoward consequences, lymph becomes rapidly organised, and movement is impeded by the formation of adhesions. Therefore, in the treatment of sprain, our first object should be to prevent or remove swelling of the injured part, so that it may be placed in the best possible condition for the action of repair. In pressure we have the most effective means for accomplishing this desirable end, and in bandaging with cotton wadding the readiest method for applying such pressure. In the most frequent sprains, namely, those below the hock and knee, the procedure is as simple as it is beneficial, and may be described as follows: Take two yards of unbleached cotton wadding (which can be procured at any draper's shop for fivepence), divide it down the centre, wrap the two pieces one over the other round the seat of injury, and then apply as tightly as possible a strong cotton bandage, six yards long and three inches broad. For the sake of cleanliness, and to prevent the horse from pulling the bandage off with his teeth, I find it well to cover the whole with an ordinary flannel bandage. There we have the entire treatment necessary for all recent sprains of the perforans, perforatus, inferior carpal ligament, cheek ligament, lateral ligaments of the fetlock, or of the inferior sesamoid ligaments. In the first instance, the bandage may remain on for twenty-four hours, and should be followed by passive exercise and massage, so as to stimulate the absorbents and to prevent the formation of adhesions. The second and succeeding application of the bandage, with pressure, may be continued for twelve hours. I may dismiss the subject of hand rubbing, by saying that we should substitute massage for it, and that we should work in the direction of the course of the lymphatics and veins, and not against it, as is usually done. The part subjected to massage ought also to be in a relaxed condition, which we may obtain in the foreleg by flexing the limb.

The cotton wadding is merely a means for obtaining evenly distributed pressure. Not only in sprains have I found this method of applying pressure beyond all praise, but also in cases of blows and filled legs, to say nothing of wind galls. I was induced to try in equine practice the effect of evenly-distributed pressure, by Dr. Henderson, of Shanghai, in May, 1888, and since then have had such marked success with it, that I use no other treatment for the injuries just mentioned. After many experiments I have found cotton

wadding the most convenient means of applying the pressure in question. The procedure I advocate is not applicable to cases in which lymph has become solid, but although it cannot cause the removal of any organised deposit, it can prevent such deposit taking place. I have found it admirable in obviating any thickening after an overreach on the flexor tendons, or, more correctly speaking, on the perforatus tendon. It also has a capital effect in bad cases of eczema of the pastern, accompanied by a filled condition of the limb. There are many hundreds of horse-owners in England, India, South Africa, and elsewhere, who could from experience gratefully speak of the surprising beneficial results of this method of applying pressure. I have certainly found it the greatest improvement ever made in veterinary surgery.

The VICE-PRESIDENT said they were all extremely obliged to Captain Hayes for his demonstration of, to him, this new style of bandaging. Captain Hayes said the bandage could be applied round the fetlock, hock, or knee, in the form of a figure eight.

Captain RUSSELL said he thought it would be very remiss on their part if they did not tell Captain Hayes how much obliged they were to him for his interesting address. The idea of this wadding was entirely new to him; bandaging they were all pretty well acquainted with, and no doubt it was largely used. He was very much in the habit of using wet sponges; it had been a matter of thought with him how to fill up the interstices between the tendons and the bones, and get a common pressure. The pressure must be equable to be of much use. There was one case in which he found some difficulty, and that was in a case of displacement of the gastrocnemious tendon where it passes over the hock. After raising the heel of the horse's shoe and putting the tendon into its place, he found the greatest difficulty in keeping it there. He got a set of flat sponges, and applied them dry, bandaged them on, and wetted them with water. It answered admirably, and the case in course of time got all right, but it was about three months before it was sound and ready to go home. He could quite see that the bandaging as shown by Captain Hayes would be of very great service, and especially so because they could use it dry.

Captain HAYES said he was rather an unbeliever in wet bandaging. The only action of warm water that they could trace, was that it checked hæmorrhage, therefore if they got a sprain, and used hot water, they undoubtedly checked the hæmorrhage, from the ruptured parts, and they found it used in human practice in internal hæmorrhage, but it must be used before the extravasated blood had infiltrated the part. In the case of a bad over-reach he wanted to have it treated dry, with a good pressure on the part, and that he procured by applying this bandage.

Captain RUSSELL said he found it sometimes good practice to alternate the dressing. He believed in slightly elevating the heel of the shoe, and had seen the best results from doing so. The next case he had of over-reach or sprain he should certainly apply Captain Hayes' suggestions.

Captain HAYES said he was entirely alive to the benefit to be derived from applying a high heeled shoe and putting the part into rest. We must not be led away however by that word "rest," but must give the part passive exercise, raising the limb from the ground, and flexing it and extending it. They did not want to put a strain on the part by making the animal move about, but it must have passive exercise, and in India they used to swim them for this purpose. They wanted passive exercise as well as massage. It not only quickened the circulation, but carried away extravasated blood and extra lymph, and prevented any deposit forming. Massage prevented adhesion. A horse began to be upright in front, his pasterns began to be more in the same lines as the metacarpals, and the reason he could not gallop was that his legs were straight. He described the mode of galloping, and said in order to

produce that beautiful style of level action it was required that the horse should freely extend its fore limbs, and he should have sloping pasterns as well as sloping shoulders.

Mr. HARTLEY said he should like to add his thanks to those of Captain Russell, for the very practical information which Captain Hayes had given to them. This style of bandaging was quite a revelation to him, although he had tried almost everything. He claimed to be guided by the same principles. He had never done anything like that they had been shown to-day. Among other experiments he used dry pressure with sheet lead, and he should like to ask Captain Hayes whether some medium of that sort for strengthening the parts would not be of service. He had also tried clay, which he had found useful, and had put on elastic bandages, but they did not do very well, they used to stop the circulation, and he believed did more harm than good. If they got a horse in a state of plethora, full of corn, before they adopted such tight pressure, would it not be advisable to reduce the blood pressure by a dose of physic. As to the advantages of the upright shoe, he thought a horse would put himself into such a position as not to injure the part, but he was with Captain Russell as to the advisability of supporting the limb. If the sheath of the tendon was injured, he was a great advocate for bandaging the limb right down to the hollow of the heel, and supporting the pan of the heel by a pillow. He advocated cooling lotions for bandages, and said he wished to thank Captain Hayes for his suggestion as to massaging the limb when in a state of relaxation. He narrated a case in which a marvellous change for the better in a severe wound had been effected by a tight bandage and a wet sponge, which he attributed to the moisture and pressure. As to the advantages of massage, he had found that out lately. He had a brown mare which he thought had what he called a knee spavin. He administered certain remedial agents and gave the knee passive exercise, and in this case he did not think they now had much bone mischief.

Captain HAYES said that the great point in sprains was to catch them quick, as there was a difficulty as to swelling, which interfered with the circulation, and they would have more or less degeneration of the fibres, and pressure would have a good effect on organised deposit; they would get degeneration of that deposit and it would pass away. He thought elastic boots were a mistake. Passive exercise and massage should be used at the same time. As to running horses with bandages, if a horse sprained its suspensory ligament he could not see, from a mechanical point of view, how the bandage applied could give any support to the suspensory ligament. Even with the perforans, the only way they could bandage would be to apply some body in front of the fetlock. He had always thought that bandaging racehorses prevented them from extending themselves as much as they might.

Mr. RUDKIN said it was quite new to him, this massage treatment, and he should certainly try it. Plastic bandages were said to be good things, and it was marvellous the excellent results that a friend of his had obtained by the use of them.

Mr. HARTLEY said he had used plastic bandages for 18 years, but if they were kept on the leg they would soon bring about a disastrous condition of things. They should be very careful to put a cloth on the top and fill it up with something, or they would soon have foreign substances working in and doing mischief. He liked to see a sprained leg every day.

Captain RUSSELL said he had found very good results from using these plastic bandages. If they had a little thickening of the leg and put these bandages on, a horse might go and do his gallop or exercise, and then take them off again when the horse had cooled down. If left on they would act like a blister.

Captain HAYES, in answer to Mr. Hartley, said he had not treated with

massage the muscles of the fore arm. He further explained the importance of evenly distributed pressure, and pointed out that in the case of the bandaging illustrated there was no danger of little bits of grit or small pieces of stone working through and injuring the part.

Captain RUSSELL then moved a hearty vote of thanks to Captain Hayes for his able address, which was seconded by Mr. Hartley, and adopted by acclamation.

Captain HAYES suitably acknowledged the resolution.

A cordial vote of thanks to the Chairman for presiding concluded the meeting.

JNO. A. ROBINSON, *Hon. Sec.*

THE GLASGOW VETERINARY COLLEGE.

THIS School was opened for the winter term on October 3rd, and the introductory address was delivered on the 19th. There was a large attendance of visitors and students. Bailie Graham presided, and Dr. LIMONT, M.A., M.B., Professor of Anatomy in the College, delivered the inaugural address, of which we give the following full report:—

Gentlemen,—After ten years spent in teaching medical and veterinary science, and after long experience of examinations both as onlooker and as examiner, it is again my duty to deliver the introductory address in this college. We are this winter face to face with a new order of things. In the light of these ten years I propose to consider certain matters that affect you very much. After passing a much stiffer preliminary examination (the same as that imposed upon medical students), you are to study for four years instead of three, and to pass examinations upon extra subjects of study. This means for you a serious expenditure of time and money. Whether or not the public will make this up to you in more fees and better fees is a moot point which I had rather not discuss. Time will show. But the money value of animals puts a serious limit to veterinary surgery. If an animal is worth £19 it is of little use to be able to cure him for £20. The son of a wealthy soap maker may, or may not, be worth £120 as an army recruit, but his mother will pay a great deal more to save his precious life. And people begin to think of doing their own doctoring all the sooner when they themselves are not the patients. It is alleged that doctors never take any of their own medicines, and there is a little truth in the accusation. For similar reasons many a man, who would not care to practise upon himself, is yet very fond of dosing his neighbour, his man-servant and his maid-servant, his ox or his ass, or anything that is his neighbour's.

Until the other day an ordinary medical student going up for a mere pass diploma got off with a strictly limited examination in chemistry, none in botany, and none in zoology. The veterinary student got a great deal of chemistry, a great deal of botany, but no zoology. Now (on paper at least) both are to suffer alike; they are to have chemistry with some chemical physics, and biology in the form of botany and zoology. If the new veterinary examinations upon these three subjects are to be on anything like the old scale for chemistry and botany, the first year's men will be overwhelmed.

I hold that the ordinary medical student has next to no need of botany and zoology. It is a little different in the case of the veterinary student, for he has more to do with grasses, grains, poisonous plants, and parasites. But he has only four years against the medical student's five. And instead of dealing with two animals (man and the dog) he has to take up man, horse, ox, sheep, pig, dog, cat, and even birds. As an anatomist and physiologist he is not likely to be so narrow as the medical students; in other words, he has less need of zoology. One argument for zoology. I can understand that when the retired naval officer is in full charge of the pleuro-pneumonic cow the veterinary surgeon will be able to apply for the management of the oyster-beds.

These new arrangements begin with a much stiffer preliminary examination, one that will bar out many men. After many years' experience I have come to the conclusion that you will never get much education out of a preliminary examination. The average schoolmaster and the cheap crammer put boys through, but they do not educate them in the process. The real educating has to be done in the first college, and our men's first college is nearly always the veterinary college. The task of the teachers during the earlier years is, therefore, no light one, and it is made all the heavier by the necessity for training the students in the contemptible art of answering questions, written and oral, sensible and ridiculous. There seems to be an idea that a heavily loaded first session is useful in turning back inferior men, thus saving them further loss of time and money. But what about the good and very good men? Are they not worthy of more consideration than inferior men? If you have a number of subjects, each with its mass of details, each with its difficulties, even a very good man is liable to be plucked by accident. A stigma is upon him henceforth, and it is well if he does not become more or less of a "chronic." I often think that there should be something of the nature of a First Offender's Act for those who trip at a mere first professional examination.

Had I my way, I would have first year's men study nothing but anatomy, physical science, and elementary chemistry. The anatomy of the bones, joints, and muscles is a capital subject for young students. It makes them use their eyes and fingers, it is a subject that can be treated thoroughly and honestly, its usefulness is plain to the dullest and laziest student that ever hunted an excuse for not working. Physical science (natural philosophy) is an exact science, and quite outside of its practical use is much wanted to keep the mental balance of men dabbling in so many inexact sciences—botany, zoology, anatomy, physiology, pathology. I am very glad to see that it is making its way into the curricula and professional examinations for the higher medical degrees. The scraps of this science got up for the preliminary examination, or picked up in the chemistry class-room and elsewhere, never did much good. The science must be learned as a whole.

The ignorance of physical science displayed in books dealing with anatomy and physiology is appalling. Take the subject of elasticity, for instance. Everybody talks about it; nobody studies it. There is a tissue described as "elastic tissue" in every text book; but so far as I remember, there is not in any text-book the slightest proof given that this tissue is more entitled to the name than any other. The power of a name is great. I have seen it argued in a pathological discussion that a certain structure was not elastic because it did not contain this tissue. According to books, the limbs of an animal are made up of a number of levers worked by muscles; and, of course, the stale, tiresome, and purely popular classification of levers into three orders is duly given in the old, irritating, and misleading phraseology. It may be taken as pretty certain that the writer, who is great upon these orders, has never heard of the moment of a force about a point. Of course, there are other machines in the body, but they are never even mentioned. There is, for instance, the couple, which is common enough. Then there is the knee. Watch a lorry horse starting a heavy load, and if you know anything of dynamics you will own that it is not for nothing that the carpus of the horse is called his knee. It is a knee. Many writers seem to draw the terms of physical science from a kind of lottery-bag. Any word will do, but "weight" and "force" are especially useful. They stand for anything. A favourite principle is that of the "conservation of force." But in the words of two distinguished physical philosophers, "the sole recorded case of true persistency or indestructibility of force which we recollect having ever met with,

occurs in connection with Baron Munchausen's remarkable descent from the moon. It is, no doubt, a very striking case; but it is apparently unique, and it was not subjected to a scientific scrutiny." The Baron seems to have a number of relatives in this country.

There is a wide field for the application of physical science to pathology. When certain epithelial cells go wrong, and their misbegotten progeny replaces bone with cancer, the softened shaft of the bone may break under the action of a force that would not harm a healthy bone. Then the vital activities of cells have an innings at the seat of fracture. This is a simple case, but it is an illustration of the truth that in tracing the course of pathological change we have to deal with the behaviour of cells (behaviour to which physical science cannot be applied), and with what happens to the diseased mass under ordinary physical laws. Again, disease may be started by undue physical conditions acting on a healthy part. A muscle, for instance, may be strained or torn. Then the cells have an innings, and are active for good or for evil. I say for good or for evil because the idea of a *vis medicatrix naturæ* is absurd. Sometimes the cells of an injured part tend to put things right; sometimes they do not: and sometimes their activity is positively mischievous. A clear understanding of elementary physical science seems to be necessary for every pathologist who would try to distinguish between distortion produced by the mere growth of cells and that brought about by physical forces acting on the part. He should know, for example, what is meant by "shear."

In the street and the stable physical science is not less useful. What is wanted here is especially a clear understanding of the doctrine of energy and a fair knowledge of dynamics. Many years ago, Brunel, the famous engineer, wrote an article on draught as an appendix to Youatt's treatise on the horse. He did not seem to think much of it, for he left it unsigned. The cycle was undreamt of in these days; yet Brunel described and figured a wheel with iron spokes like those of the modern cycle. Of course, in this wheel there is no "dishing," with the inevitable loss of energy by friction. And he showed that with an elastic tyre there would be no increase in the draught. Carriages remain much what they were in Brunel's time; but you know what the cycle, running on the same roads, has become. In draught you have two objects in view. First, to lessen the expenditure of energy by the horse; second, to save the horse from injury done by sudden and violent efforts. Physical science decides whether any particular arrangement works for good in either or both of these directions. But it does not decide that such an arrangement should be used. The Glasgow lorry is bad for the horse; but, because the streets are fairly paved, not very bad. Accordingly, the great convenience of the flat, low platform overcomes the scientific objection to the low wheels. But in many places the high-wheeled waggon is a necessity. In cases like these, simple but real science makes a man practical. He knows what he is about in considering any particular case.

Gentlemen, the examining body and the teaching schools are often twitted with turning out men who may know some science, but who are certainly not fully competent practitioners, or (what is not exactly the same thing), suitable and profitable assistants. And it is interesting to notice that Mr. Fleam's (anonymous) letter in the *Veterinary Record*, describing his very latest assistant, is plaintively echoed by Mr. Sawbones in the very next number of the *Lancet*. But would not either of these gentlemen feel rather at sea if suddenly set down in a strange surgery in a strange countryside, and with, perhaps, a very strange gentleman for principal? After all, the public do not expect a young man to be fully competent in any profession. If one gets into trouble, he does not retain counsel for his defence on the theory that a man who was called to the bar last week can't have forgotten much of his law. And twenty-one won't pass for forty. A few weeks ago a lady

patient reproved me for growling over growing bulk. "It makes you so much more impressive," she said. Dr. Oliver Wendell Holmes says in one of his books that every physician ought to be bald. I have known the examiners allow certain students time to qualify. But probably they will agree with me that most students are bald enough already—on paper. In practice, monopolist licensing boards in any profession can only exact very modest attainments; and, perhaps, the chief duty of the schools is not to turn out a finished article, but a man ready, willing, and fit to learn during all the years of his life.

Most of you, gentlemen, have to live in lodgings, and they are often dull and depressing. If you want a little brightness, go to a theatre, not to a music-hall. I may be old-fashioned, but I think that there is far too much of the music-hall nowadays. In the theatre, if you cultivate a taste for what is best, you may learn a good deal—point, effect, directness, the pronunciation of the Queen's English. No scholar and gentleman need be ashamed of a taste for the play. If you have a turn for music, spend a shilling pretty often in going to the orchestral concerts. At first the band is a little bewildering, but you soon come to despise the trashy concert. On Saturday afternoon go for a long walk in the country. Remember that the city is full of libraries, and that you can refresh yourselves upon good books for twopence a week. If you read nothing but novels, read good ones. Hardy, Blackmore, Stevenson, Conan Doyle, Walter Besant, at his best; all will lift you out of the weariness of dull routine, and leave you the better for a few hours of other worlds and other language. Do your duty, gentlemen, in the station to which you are called, and you will generally find that people will fairly well do their duty to you.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

At the monthly Council Meeting, held on November 7th, Mr. Ashworth reported that the leaflet on anthrax, which had been prepared and issued immediately after the last meeting of the Council, in accordance with the directions then given, had been extensively circulated amongst owners of stock, veterinary surgeons, and others interested in the subject. The Committee drew the attention of the Council to the special scientific investigations into the causes of abortion in cattle which were now in progress at the Royal Veterinary College, under the auspices of the society; and they would feel greatly obliged to any members whose herds might be suffering from this disorder, if they would kindly communicate with the college authorities, with a view to their sending an aborted animal to the college for the purposes of experiment and observation. A letter had been read from the Royal Lancashire Agricultural Society on the subject of the prevalence of tuberculosis in cattle, and asking the society's co-operation with a view to combined action on the part of the principal agricultural societies in urging the Board of Agriculture to adopt measures dealing with this disease. The Committee did not advise that action should be taken by the society in the direction indicated until the Royal Commission on Tuberculosis, now sitting, had presented their report.

Professor Brown had presented the following report:—

Pleuro-Pneumonia.—Since the last meeting of the Committee several outbreaks of pleuro-pneumonia have been reported. The suspected were in each case slaughtered, but proved, on *post-mortem* examination, to have been affected with other diseases.

Foot-and-Mouth Disease.—On the afternoon of the 27th ult., the local veterinary inspector was called in to examine some cattle on a marsh at Rainham, in Essex, and found them to be affected with a disease which he

considered to be foot-and-mouth disease, and he accordingly instructed the police to prevent all movement of cattle from the marshes. On the following day the inspector again attended, and was satisfied as to the nature of the disease, and at once reported to the Board of Agriculture. One of the veterinary officers of the Board proceeded to Rainham and confirmed the opinion of the inspector. Of the seven cattle which were in one marsh, six were badly affected with the disease on mouths and feet. The seven cattle were slaughtered and buried on the spot, and an order was at once passed to prevent movement of animals from the district, and also to prevent persons from passing through the marshes, and the whole district round has been kept under strict observation. Up to the present time no further cases have been reported, and no clue has yet been obtained as to the origin of the outbreak.

Swine Fever.—The number of cases, which for some time past has reached an average of over 500 per month, has recently fallen to little more than half that number. But it may be observed that a decrease in the number of attacks has always been noticed at this season of the year.

Anthrax.—There have not been any serious outbreaks of anthrax recently, and nearly all the cases reported have been confined to cattle.

Rabies.—This disease has been very prevalent lately, especially in Lancashire and the West Riding of Yorkshire. Only one case has been reported in London.

The committee gave notice that at their next meeting they would move—(1) for the renewal of their annual grant of £600, of which £500 would be allocated to the Royal Veterinary College, and £100 reserved for general purposes; and (2) for the payment to the college, during 1895, of the special grant of £200 for the purpose of further investigations into abortion in cattle.

Notes and News.

Tuberculous Cows in France.—Of 20,000 cows examined in 1893, in the Department of the Seine, only 68 were found to be tuberculous—a proportion of 3·4 per 1,000. The fact is ascribed to the surveillance exercised by the sanitary service and the hygienic measures carried out in the care of the animals.

Curious Case of Adoption.—The following, from the *American Agriculturist*, favours the suggestion which has been offered as a solution of the supposed deferred birth of a second calf. Cows have been found with a young calf in addition to an older one they gave birth to some four or five months before. And though no one had seen this second birth, or expected it, yet the fondness of the cow for the little animal has led to the conclusion it was her own. "It was on the farm of Mr. Frank Chase, in Aroostook county, who was somewhat astonished, one summer evening, at seeing one of his Jersey heifers come up at night followed by a very dissimilar pair of young. One of them was her own calf, while trotting complacently beside it was a young caribou or reindeer of about the same age. During the afternoon the cows were feeding near the woods, from which there approached the hungry little creature. The motherly instincts of the heifer were aroused, and she met the mute pleading of the stranger in a friendly way. It was soon drawing its much needed nourishment from one side, while her own offspring tugged at the other. From that hour the adoption was complete, the heifer seeming to show the same care and solicitude for her *protégé* as for her own calf. It is supposed that the little foundling had been abandoned by its dam. Twins are quite common among caribou, and triplets are not unknown. When a dam finds herself with more numerous offspring than she can supply with sustenance she disowns the superfluous one, and leaves it to shift for itself or perish. In the case under consideration, the deserted youngster found quite

unusual adoption and nourishment. It readily adapted itself to civilised life, and became very tame, fearlessly approaching and licking the hand extended toward it, then striking out playfully with its front feet. It was treated with great friendship by the entire herd of cows, which seemed equally astonished and amused by its agile and frolicsome pranks. It was a very interesting little creature, but somewhat awkward and ill-shaped as to legs. It was observed that however active and long-continued its frolics might be, it never panted or breathed audibly, owing to its large lungs."

Correspondence.

EXAMINATIONS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

DEAR SIR,—I shall be glad if you will kindly make the following resolution of the Council of the Royal College of Veterinary Surgeons known in your JOURNAL.

A. W. HILL, *Secretary.*

Examinations.

"That in future cart horses as well as other horses be provided at the Class 'C' practical, and that practitioners be invited to send any interesting case possessing well-marked defects."

PUBLISHERS' ANNOUNCEMENT.

THE Publishers have much pleasure in announcing that the Editorial Department will in future be under the supervision of Principal Williams, F.R.S.E., F.R.C.V.S., of the New Veterinary College, Edinburgh, who will be assisted by an efficient staff, and purposes, while conducting the JOURNAL upon similar lines to those which have long distinguished it, to introduce other matters of practical interest to the profession, and cordially invites veterinarians to forward reports of cases in their private practice, and other communications to him at the New Veterinary College, Edinburgh, marked on the outside, "VETERINARY JOURNAL."

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from J. H. Carter. Burnley; F. C. Mahon, London; Professor McCall, Glasgow; T. B. Goodall, Christchurch, Hants; R. Rutherford, Edinburgh; Dr. J. T. Duncan, Toronto, Canada; A. W. Hill, London; Veterinary-Captain Joshua A. Nunn, Lahore; Messrs. Hazell, Watson and Viney, London; F. Somers, Leeds; C. Pack, Lymington, Hants; Dr. Boschetti, Parma, Italy; J. A. Robinson, Market Deeping.

BOOKS AND PAMPHLETS: Bulletin et Mémoires de la Société Centrale de Médecine Vétérinaire; Heavy Horses: Breeds and Management; Bulletin of the Johns Hopkins Hospital; The Johns Hopkins Hospital Reports; Smith's Physicians' and Surgeons' Visiting List; *Dr. Boschetti*, Calzatura Preservativa e Curativa per le Malattie dei Piedi di tutti gli Animali Domestici.

JOURNALS, ETC.: *Archiv für Wissenschaftliche und Praktische Thierheilkunde; Revue Vétérinaire; Journal of Comparative Medicine and Veterinary Archives; American Veterinary Magazine; Cape of Good Hope Agricultural Journal; British Medical Journal; Journal de Médecine Vétérinaire et de Zootechnie; Lancet; Edinburgh Medical Journal; Thierarzt; Annales de Médecine Vétérinaire; Recueil de Médecine Vétérinaire; Clinica Veterinaria; Presse Vétérinaire; American Veterinary Review; Echo Vétérinaire; Baily's Magazine; Mark Lane Express; Live Stock Journal; Medical Press and Circular.*

NEWSPAPERS: *Bradford Observer; Lahore Civil and Military Gazette.*